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The Suppression of Hemorrhage

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THE arrest of hemorrhage is one of the most important points in connection with the technic for the treatment of not only surgical but also accidental wounds. There are two reasons why hemorrhage should be controlled.

1. To prevent a fatal termination from excessive loss of blood.

2. Hemorrhage lowers the vitality of the animal's system and hence retards the healing of wounds. Also blood clots in a wound forms a nidus for the development of microorganisms.

Fatal hemorrhage, so far as wounds are concerned, occurs when a large vessel is severed and professional assistance is not at hand. But it may result, even, in spite of the efforts of the practitioner, when one or more large vessels are severed and so deeply situated that they cannot be ligated. This may occur in the case of extensive wounds due to the penetration of a shaft between the forearm and the chest, or at any part of the pectoral region, or in the vicinity of the inferior aspect of the neck.

In such cases but little time is allowed for the efforts of the surgeon to prove successful. Very often more than one vessel is severed and unless ligation can be adopted without delay, a fatal termination will result. Plugging the wound with tow is of little or no use when the hemorrhage proceeds from a large vessel. In my experience the only plan that offers any chance of success is to insert a temporary plug of tow and to cast the animal immediately, then seek for the bleeding vessel (enlarging the wound if necessary) and, having secured it with an artery forceps, apply a ligature. In some instances it may not be necessary to cast the horse, as in consequence of the loss of blood he does not resist the necessary manipulation, but the procedure is far more easily and satisfactorily carried out when the animal is in the recumbent position.

As already remarked, all our efforts may fail in cases where the vessel is out of reach. Plugging with tow may succeed when the wounded vessel is not of large size, but even here it is not to be advised as although it may temporarily arrest the hemorrhage, there is always the risk that secondary bleeding may occur and prove fatal in the absence of the attendant. It may be laid down as a rule that ligature is the only safe method to adopt in the suppression of hemorrhage, of course if the vessel cannot be secured, then the only resource is the adoption of plugging the wound.

It sometimes happens that although a vessel may be secured by the artery forceps, in consequence of its depth a ligature cannot be applied. In many instances, by the employment of Schoemaker's pattern of forceps, in which by means of a groove at the point of one of the blades, a ligature is held in position, a deep-seated vessel

may be ligated. This is a most useful instrument and should be in the possession of every practitioner.

I have frequently left an artery forceps *in situ* for twenty-four hours in cases where a ligature could not be applied. Care should be taken to tie up the animal during the interval so that he may not lie down and so cause the instrument to become detached, or to be driven inwards by pressure.

In preparing for major operations, a plentiful supply of artery forceps of large and small sizes should be provided, as one never knows when a large vessel may be severed. There are so many patterns of these instruments now on the market that a selection of the best is not an easy matter. Personally I prefer the pattern known as the Mayo-Ochner, which is of the "rat's-tooth" type and very efficient. For ease in getting the ligature to slip down the forceps, Greig-Smith's pattern can be recommended, and the larger sizes are specially useful for ligating large vessels.

As to the ligature material, some prefer silk, others catgut, but I prefer the material known as "Chinese twist," which can be obtained in all sizes, can be readily sterilized and stands great strain. Nothing is more annoying when ligating a vessel than to have the ligature material break at a critical moment.

In the case of small vessels, I have found that Blunk's hemostatic forceps are very convenient and reliable and no ligature is required. There are certain operations in which the question of the arrest or control of hemorrhage is of special importance.

Tumors in the region of the shoulder, also known as "collar" tumors, in some cases depending on the presence of botryomyces, in others, having a doubtful etiology.

When ordinary treatment fails, i. e., locating the abscess by means of a trocar and cannula, free incision, curetting the cavity, and plugging with tow soaked in tincture of iodine; then excision must be resorted to.

A knowledge of the anatomy of this region and of the firm consistence of the tumor and its extensive attachments indicates that serious hemorrhage is likely to occur unless care be taken in the technic of the operation. The position of the carotid artery should be carefully noted, so as to avoid injuring this vessel. But in my experience the vessel which is most likely to be severed is the ascending branch of the inferior cervical artery. In many instances I have located this vessel and ligatured it prior to incising the parts in the vicinity and thus saved much subsequent trouble and time. And here I may remark that in every instance and in every region when we come across a vessel which is likely to be severed during the operation, it is a nice plan to ligature it before proceeding further.

Large pressure forceps are very useful to hold deep-seated portions of the tumor. The growth is severed along the edge of the forceps and any vessels that are cut can be seen and secured readily, before the structures are let go.

After the tumor has been removed, and all bleeding points secured, I advise packing with carbolized tow in order to combat any danger of secondary hemorrhage. Healing by first intention is not to be expected and the packing can be removed within twenty-four hours. I have very serious secondary hemorrhage from cases of this kind, and hence I find that firm packing immediately after operation is the best plan to adopt.

When secondary hemorrhage does occur it is very difficult to suppress; these tumors have such extensive vascular attachments that bleeding may be very profuse, and when it occurs at night time, and is not observed and checked, a fatal result may ensue. In the case of a quiet animal, the bleeding vessel or vessels may be located and secured, but otherwise it may be necessary to cast him in order to carry out the necessary procedure.

In less severe cases, firm plugging with tow and deep suturing of the edge of the wound will prove successful. The great objection to firm plugging in the case of all wounds is the extensive swelling that usually results, hence I always prefer, whenever possible, to secure the bleeding vessel. Moreover, there are instances in which the hemorrhage recurs after the

packing is removed, and in consequence the cleansing of the wound cannot be properly carried out.

Castration: Why hemorrhage occurs in some cases after castration and not in others when the measures adopted to secure the spermatic artery are similar in each instance, is a problem which is not easy to solve.

Generally speaking, the most serious and annoying cases are those that occur some time after the operation, say within twelve or twenty-four hours. As my experience of castration cases is limited to those operated on by torsion, I can only deal with the subject from this point of view. This experience has taught me that in the vast majority of cases if torsion is properly carried out and the spermatic artery is in a healthy condition and the animal healthy, hemorrhage does not occur. The exceptions are those cases in which we cannot account for the hemorrhage.

The procedure to be adopted depends on the extent of the bleeding. We frequently observe cases that bleed profusely after getting up, but this soon ceases without any treatment. Obviously such do not depend on hemorrhage from the spermatic artery, but the bleeding arises from the artery of the cord or from a vessel in the scrotum.

When the hemorrhage is profuse and clearly arterial, the best plan is to cast the animal, seek for and secure the severed end of the spermatic cord and apply a ligature. This is far preferable to plugging the inguinal canal and scrotal cavity with tow with its risks of secondary hemorrhage when the packing is being removed, and the extensive swelling which always results. In the case of secondary hemorrhage occurring at night time plugging with tow may be the only practical measure to be adopted under the circumstances.

In the after-treatment care should be taken to remove all blood clots, otherwise a septic condition is likely to result. It must be admitted that in many cases the hemorrhage after castration ceases spontaneously. The measures adopted, such as throwing cold water over the loins or applying cloths soaked in cold water to the same region, are of doubtful efficacy.

That "weedy" debilitated colts are most subject to this variety of hemorrhage is well known. Again aged donkeys and mules are very apt to bleed profusely unless special care is taken in the performance of torsion of the artery.

I have often observed that castration performed under deep chloroform anesthesia is likely to be followed by hemorrhage some hours afterwards. This does not occur when a lighter degree of anesthesia is employed.

Epistaxis: This occasionally gives rise to considerable trouble, especially when arising from injuries about the facial and nasal region. As it is dangerous to plug both nasal passages of the horse, this method of suppressing the hemorrhage is not practicable. If one nasal passage only be plugged, the blood finds its way down the other.

Local injection of adrenalin proves useful and raising the horse's head will also assist in controlling the hemorrhage but care must be taken lest the blood gain entrance to the trachea.

Accidental Wounds: I have already referred to the question of hemorrhage arising from injuries due to shafts penetrating the body. But there are many minor injuries in which hemorrhage may be a troublesome feature. Wounds received during hunting furnish a large number of cases in sporting districts. In these the same golden rule applies, viz: *always secure and ligature a bleeding vessel whenever possible.* Avoid plugging and tight bandaging unless as an emergency measure.

As regards hemostatic agents, they have no effect in the care of vessels of any size, and the majority of them have irritating action in the wound.

Deep punctured wounds, in which it is not possible to secure a bleeding vessel, without making an extensive opening, may be plugged with antiseptic gauze.

Wounds involving the digital arteries, in the region of the coronet, are often troublesome, as it is by no means easy to secure the bleeding vessel, especially in the case of a nervous excitable horse. The Mayo-Ochner artery forceps will be found very useful for cases of this kind.

When an artery or vein is exposed in an extensive wound but not severed, it is advisable to apply a ligature, since the walls of the vessel may give way and serious hemorrhage result. Should it become necessary to apply a ligature to the carotid artery it must be remembered that in consequence of the collateral circulation both the proximal and the distal ends of the vessel must be secured.

As regards the employment of the actual cautery as a hemostatic agent, in consequence of the pain inflicted and the destruction of tissues it produces it is now being discarded. In Great Britain it is still employed by some practitioners in the operation of castration and also docking. From a humane and scientific point of view it is to be hoped that the suppression of hemorrhage by means of the actual cautery will soon be regarded as one of the relics of the barbarous ages.

Internal hemorrhage and its treatment will be considered in a future article.

The Technic for Castrating Cows*

By DR. AD. SCHEIDEGGER, Translated by DR. LEWIS W. FETZER
Washington, D. C.

ALTHOUGH the indications for castrating cows are becoming less and less, thanks to the preventative measures and methods for treating ovarian diseases, there still will remain a certain number of animals in which ovariectomy must be done as a last resort. This is especially true for those animals which have morbid sexual desires.

The success of an operation of this kind depends very much upon the method employed for conducting it.

It cannot be disputed that fatal results, etc., occur now less frequently, and which is due to improved operative procedures.

The ecraseur, which was formerly used extensively by veterinarians, is now rarely employed in ovariectomies. On the other hand, the various ovariotomes and auxiliary instruments employed for tying off the ovaries have certain disadvantages, amongst which are the tendency to postoperative hemorrhage. This occurs in certain animals particularly where the operation has been conducted too rapidly.

Some veterinarians have used the well-known elastic ligature method (Bertschi) with pronounced success, while others after using it for a time gave it up on the ground that the rubber rings employed were not strong enough. Very often the rings were torn, or they became loose when once fastened down and did not destroy the ovarian function. Naturally estrum set in as before. Obviously such an occurrence cannot be considered a recommendation for the veterinarian who did the operation.

Aside from what has been said above in regard to the elastic ligature method it certainly possesses a great many decided advantages over other methods, and on this account the author was loath to abandon it, and made an attempt to find stronger ligatures for the purpose, and at the same time, some which would not slip.

At the outset it was evident that rings would have to be prepared which would surround even the thickest ovarian ligament and at the same time destroy ovarian function.

Ligatures were therefore prepared by a surgical instrument maker (H. Hauptner, Berlin) having an internal diameter of 43 mm. and an outer one of 57 mm. The diameters of the old ligature were 25 and 35 mm. respectively. The new ligature was also made one-third thicker than the old.

The glass beads present on the old form of ligatures were substituted by a broad grooved metallic ring.

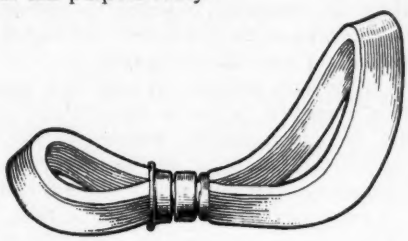
From the illustration given below it can be seen that the metallic ring on one end is bent outward and is rounded off so that the ligature can be tightened without any difficulty; the other end of the ring is

*Berlin, Tierarztl. Wochenschrift, 1912, Vol. 28, No. 15, p. 266.

narrow and edged, which prevents the same from slipping and loosening the ligature. As a ligature carrier the one previously recommended by Bertschi is employed.

The ligature has given good results in practice and in no case where it was used was there any indication of an incomplete shunting out of the ovaries.

This method must finally be considered the safest, simplest and most easily conducted operative procedure which we have for this purpose today.



Abdominal Surgery in the Horse*

By H. A. WOODRUFF, M. R. C. V. S., London, England

ABOUT a year ago the present writer had occasion to perform laparotomy in an aged hackney mare and a description of the case is not without interest. The patient was sent into hospital on August 15, with a history that she had an attack of colic two days previously, had been attended temporarily by a veterinary surgeon, and although the acute symptoms had passed off, she was not by any means fit. In hospital the mare was found to be fairly quiet, not in any acute pain, somewhat off feed and with a temperature of 102° F. The most noticeable feature was, that she passed no dung at all.

On examination *per rectum* it was reported to me that a large amount of feces was found and removed, and that the rectum appeared sore and very irritable. On August 17 the mare was reported to be in the same condition, and I then made my first complete examination of the patient.

No feces had been passed, and yet the mare was not tympanitic and seemed fairly comfortable. Putting my hand in the rectum the condition was speedily diagnosed as rupture of the rectum. A large rent had been made in the right side of the bowel, of such a size that the whole hand was easily passed through, and there was a large collection of feces in a pouch outside the rectum. Examination caused pain.

On removing the fecal matter there was a very offensive smell, and shreds of decomposing connective tissue came away. Evidently the peritoneal cavity was not opened and peritonitis had not made its appearance.

The prognosis was a bad one; but permission was readily given by the owner to do anything necessary or likely to save the mare. It was thought that the only possibility of getting the rent in the rectum to heal was to wash out the pouch to the right of the bowel, and to prevent fresh fecal contamination. In order to do this, a colotomy was decided upon, and carried out next day. The mare received no solid food after the diagnosis was made, but was given two gallons of milk daily, which she took voluntarily.

Operation, August 18.—She was cast on the off-side, and an incision was made in the flank through the skin, both oblique muscles, the transversalis and the peritoneum. Introducing the hand covered with an india-rubber glove, the floating colon was secured, and a loop, about the middle of its length, withdrawn. This was secured by passing a steel rod behind the summit of the loop through the mesentery. Rolls of sterilized gauze were used to pack the opening in the flank round about the knuckle of intestine, and finally an opening was made into the bowel with a hot iron so as to prevent hemorrhage.

A few pellets of feces were passed out through the hole, and then the patient was allowed to recover from the anesthetic. On getting back to the box an enema was

*Reprinted from *The Veterinary News*.

given into the upper part of the bowel, and a considerable amount of feces got away, whilst the lower part, including the rectum and the extra-rectal pouch, were thoroughly washed out with chinosol lotion.

On the next two days, August 19th and 20th, there was a rise of temperature to 103° F., and respiration was considerably quickened. The pulse was not good, but the mare took the milk well. The enemata and irrigations were repeated each morning.

On August 22, adhesions had formed up round the knuckle of bowel, and to give freer vent to feces and provide better access for irrigation of the rectum, the knuckle of bowel was cut off with the actual cautery. Thus two openings were left in the flank—the one into the upper bowel, the other into the rectum, and the wound in the skin and muscles was contracting round them. By this time the abnormal temperature had subsided, the mare was comfortable, dressings over the wound were retained by means of a roller towel kept tight by safety pins, and the mare was allowed to lie down.

From this time recovery went on with no untoward symptoms, except that the passage of liquid feces caused some soreness of the skin under the artificial anus. More and more solid food was given until the mare returned to a normal diet of crushed oats, bran and chaff, and some green stuff, and with this diet the feces were firmer, and irritation of the skin no longer serious.

So far the case had done well, and had the mare been required for a brood mare, or for use on a farm, she might have been left alone. After five weeks, she had made up the loss of condition and was perfectly fit. The rent in the rectum had closed in, and feces would have passed over it without harm had the continuity of the bowel been made good.

As the mare was used for town work, an attempt was made to join up the two separated ends of the small colon.

On September 24th, after due preparation, the mare was again cast, chloroformed, and the operation proceeded with. An elliptical incision was made, including both the bowel openings with a narrow margin of skin round them, and an attempt was made to bring out the two ends of the bowel still inserted into an island of skin and muscle.

In this attempted dissection, an unfortunate accident happened in that the upper piece of bowel was cut into and fecal matter escaped into wound, soiling the edges of the incision. After securing the two ends of the bowel and bringing them outside, a short piece was amputated from each end, after bowel clamps had been fixed, and an end-to-end anastomosis was completed, the bowel being then returned to the abdomen.

The flank wound was rather difficult to deal with, the edges had to be disinfected, and then sutures inserted, and the edges did not approximate well. The operation was a long one, and the patient suffered a good deal from shock afterwards, and in twenty-four hours showed signs of septic infection, with rise of temperature, rapid wiry pulse, and anxious expression. She died on the second day, September 26th.

The postmortem examination was made by my colleague, Dr. A. L. Sheather, who reported that there was "a slight defect in suturing at the omental attachment of the gut, otherwise the join was beautifully healed." Further, he found "an abscess (?) cavity containing gelatinous pus-like material, and extending forwards in the thickness of the abdominal wall." "Patches of peritonitis on gut" in neighborhood of bowel anastomosis.

Thus it may fairly be said that the animal died from a combination of toxic absorption from the infection round the incision and from shock. I am of the opinion that the slight defect in the suturing would not have been serious had the other conditions been normal.

Unexpected Fatalities in Practice

By W. J. MARTIN, V. S., Kankakee, Illinois

(*Concluded from page 484, October issue.*)

I WILL endeavor to enlighten you as far as my experience goes, based as it is on careful observation and postmortem examinations. I believe that in the majority of these cases death can be ascribed to injuries from the fetus in its death struggles *in utero*. I believe, in fact I know, that the strength of a fully developed fetus *in utero* is much greater than it has ever received credit for being, and I feel quite certain that if any of you have seen as many bruised and battered uterine walls as I have, you will agree with me. You will quite often find this condition of the uterus in mares that have died after dystokia where rectification and delivery of the fetus was effected quite easily and without the use of a single instrument, not even a rope, and we cannot arrive at any other conclusion than that the mare was literally kicked to death by her own fetus while it was smothering in her uterus. One would naturally suppose that the placenta would protect the uterine walls against any such injury, but if you will make a careful examination of such cases, you will find, in a large majority, the placenta torn into shreds and the fetus lying entirely free from its covering.

I have never seen anything in any of our textbooks on veterinary obstetrics that even so much as hinted at this cause for death after parturition, hence, I feel that no apology is due for bringing this subject to your attention, hoping thereby that we will have a free and full discussion on the subject, and that you may be able to verify or dispute the correctness of my assertion by postmortem examination and reports of the results at future meetings of this association.

DISCUSSION

A. H. BAKER: Doctor Martin mentioned that sudden death sometimes follows the administration of medicines intravenously. I gleaned from his remarked that he attributed the death to a little air getting into the circulation. He emphasized this by asking all of us to remember this point.

We were all taught by our professors that it was a very dangerous thing to let a little air get into the circulation—that a very little air meant sudden death. Soon after graduation, Dr. J. F. Ryan of Chicago, and I used to buy old horses, tap the jugular vein and take turns blowing air into their circulation. It would be fifteen minutes, or more, before we could make those horses stagger. They would begin to roll, and after considerably more blowing we would succeed in killing them. We filled them full of air, and it then took about twenty minutes to kill them.

Now, on the other side: I have found the vital point to be the slowness of administration. Any kind of drugs (possibly with the exception of the normal salt solution) must be given very, very slowly, drop by drop, almost, to do it safely.

When barium chloride first came out the German recommended a Gram intravenously in two drams of water. The first case I tried it on was apparently a very mild case of colic in a 1300-pound horse in good health. The right jugular vein was opened and I just shot it in as you would a hypodermic. In one minute he was almost standing on his head and in four minutes he was dead. I have seen several similar deaths. You will find in hearly all of the writings of prominent men that they recommend that intravenous injections be given very slowly.

W. J. MARTIN: Doctor Baker will not deny that fatalities do occur, and occur suddenly in intravenous medication. We are all aware that it is not necessary to use a bicycle pump. I admit that they are rare, but they do occur. I do not know whether they are due to rapid injection or the entrance of air into the circulation, but I have not the slightest hesitancy in saying that intravenous medication is extremely dangerous at times. It is well known that

it often ends fatally in human practice. We will all admit that under some circumstances large amounts of air can be pumped into the arterial or venous circulation without untoward results, and then, again, a very little will cause death. That is known in human as well as veterinary practice. I merely wished to emphasize the need for care.

N. I. STRINGER: I should like to ask Doctor Baker why a horse will sometimes die in three or four hours after a dose of barium chloride. I have not been using it much recently, but I have had cases where the horse would die hours after the administration.

C. C. MILLS: Doctor Stringer's cases might have had ruptured liver. I do not believe every case of a death four hours after giving barium chloride is due to the barium chloride.

Another point brought out by Doctor Martin with regard to the half-ounce dose of chloroform. I think very likely the colt would have died just as quickly if he had had no chloroform.

I recently performed an operation for a small umbilical hernia. I had not any more than got the animal tied until there was an interruption of the respiration and I saw that he was about to die. He had had no anesthetic and very little food, but he died before I could release him. I think in such cases the death is due to pressure and complications from the over-distended stomach.

Another thing I wish to mention: Doctor Martin's experience and Doctor Brownlee's question as to the cause of death following comparatively easy labor. It seems to me, from a practical point of view, in the severity of the parturition itself that complicates labor, the conditions that develop there, are decidedly more contributory to the death of the animal than would be the death struggles of the dying fetus. In fact, I believe you will bear me out in saying that in cases where I have been called and the fetus was still living, that I have never felt those fearful struggles. I do not see where they will ever find the room to deal a blow that would do any material damage, or where they would get the muscular contraction. It might possibly give a blow that would cause death if it were a distance of two or three feet, but being in the position it is, I do not see how it is going to do so.

I should be glad to be shown positive evidence that this is the case, but it seems to me there are a dozen other things that would be more contributary to death in these cases than the kicking of the fetus. A violent contraction of the uterus upon a fetus that because of a malposition could not be expelled I think decidedly more liable to injure the uterus than any movement of the fetus.

W. G. HASSEL: As to death three or four hours after the administration of barium chloride: I have been using it for years. I prefer it, in indigestion, to eserine or arecoline. I use it in probably seventy-five or eighty cases a year and my losses are very small. If I have a weak heart I usually inject strychnine first and then give arecoline and digitalin, and have had no bad results.

THE treatment of canine distemper with Monoiodamidodibenzol. J. Ban. (Allatorvosi Lapok, 1912, Vol. 35, No. 22, pp. 255–257.)—Monoiodamidodibenzol, a preparation which simulates salvarsan very much, was successfully employed by this author for cases of distemper in dogs. The doses given subcutaneously were a 0.2 to 5 Cc. of a 0.5 to 2 percent aqueous solution of the compound. The substance acts by virtue of its bactericidal properties.

THE treatment of contagious vaginitis in bovines. A Gartner and E. Walter. (Berl. Tierärztlich. Wochenschrift, 1912, Vol. 28, No. 8, pp. 133–140.)—The mucous membrane of the vagina of infected animals was anointed with a Eucerin-Bacillol solution, i. e., eight percent Bacillol and twenty-five percent of water. The treatment was repeated every second day and favorable results were obtained in some instances in four to five days; in others it required longer.

The Chemical Changes Taking Place in Milk Under Pathological Conditions*

By LEWIS W. FETZER.
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(Abstract)

IN 1907 a study was begun in the laboratory of physiological chemistry at the Maryland Agricultural Experiment Station of the chemical changes taking place in the milk of animals suffering from inflammations, other than tuberculosis, of the mammary glands. The work was done in conjunction with the veterinary department and was completed in the fall of 1909. Owing to pressure from other duties and employment elsewhere I have not been able to make a complete report upon this topic until the present time.

As we all know, there are numerous analyses of milks of abnormal composition on record, some of which are stated to be of pathological origin, and others which undoubtedly originate from animals having a mammary gland affection. In practically all instances, however, the analytical data which are presented are incomplete and almost always are confined to the constituents which are reported in commercial analysis, i. e., fat, total solids, solids-not-fat, and possibly lactose. Another feature which has not been taken into account when reporting previously recorded analyses is the stage of the disease at which the sample was obtained. This is a very important point which must be considered at all times, if the results obtained are to be utilized.

We were very fortunate in locating a barn which contained a herd in which mastitis existed. The disease had previously appeared from time to time in this barn without leaving any apparent severe effects upon the animals.

The plan followed in this work was the following one: The overseer of the dairy barn and his helpers were instructed by Dr. S. S. Buckley, the veterinarian of the Experiment Station, to report to him any abnormality which they might note in the behavior of the animals, and furthermore, any appearance of redness, tenderness and hardness on and in the mammary glands. They were, in addition, instructed to report any change in the color and consistency of the milk and the amount of milk obtained.

Our main purpose in setting up a plan of this character was to enable us to study the milk from these animals throughout the cycle of the disease, i. e., from its inception until the time when the mammary gland appeared clinically normal and the milk had assumed its right appearance. In this connection I will say, however, that a milk that had the appearance of being normal and comes from an udder which has apparently healed is no guarantee that the milk is fit for human consumption.

On receiving the report of the dairyman or milker that such and such a cow showed some unusual peculiarity in regard to its gland or the milk therefrom, the milk was drawn in sterile Erlenmeyer flasks or sterile quart milk bottles. If the sample was taken early in the morning it was placed in a refrigerator and taken in work on the same morning as soon as the laboratory opened. If sampled in the late afternoon the milks were placed in the refrigerator and kept until the following morning, when the analysis was begun. Most of the samples of milk were obtained in the morning. In no case was a milk examined which had taken the form of a jelly or contained a compact jelly-like mass. The reason for this was that we wanted to examine the milks which were most liable to be passed on into the milk supply. The observations made were as follows:

General history of animals:

Breed of animals.
Age.
Number of calves.
Frequency of abortion.
Kind of barn kept in previously.
Whether a good milker or not.

Clinical history of animals:

*Reprinted from Original Communications, Eighth International Congress of Applied Chemistry, Vol. XIX, Page 111.

Date of inception of mastitis; physical condition of mammary glands at the beginning and during the cycle of the disease; whether one or more quarters were affected; the duration of the disease; and if the quarters affected were finally rendered worthless as far as milk production is concerned.

The Milk:

(a) Odor; consistency; whether it contained flakes or stringy pus in suspension, blood, etc., or a sediment.

(b) Microscopical examination—the nature of the sediment obtained with the centrifuge.

This part of the examination was very limited, as we had only a very small laboratory force at our disposal. It consisted of obtaining a differential leukocyte count and observations as to the morphological characteristics of bacteria present.

(c) Chemical examination.

In the chemical work the observations and determinations made were as follows: Reaction, total solids, total nitrogen, total protein (nitrogen X 6.38), casein, albumin, globulin, amids, peptones, ammonia, lactose, fat, cholesterol, lecithin, ash, ash constituents; potassium, sodium, calcium, magnesium phosphoric acid, chlorin, sulphuric acid and iron.

Enzyme tests: Catalase, peroxidase, oxidase and reductase.

The principal changes noted in the chemical composition of the milk during the pathological process were as follows:

Acidity: Most milks at the beginning of the process showed a diminution of the apparent acidity. This in some instances went on until alkalinity set in, where it remained until the disease began to undergo resolution, after this the acidity gradually rose to its normal point again.

Total solids: In acute cases the total solids were high at the outset, but as the process went on there was a diminution of the same.

Total solids-not-fat: In some instances there was an increase, while in others no marked change took place.

Total nitrogen and protein (n. *X* 6.38): Increased at the outset and remained increased until resolution took place.

Casein: Diminished in some instances and remained so until the pathological condition was eliminated.

Lactglobulin? (Serum globulin): Increased until resolution set in.

Albumin? (Serum albumin): Increased during the whole process, then back to normal.

Lactose: Diminished gradually as the process went on, then back to normal.

Fat: Diminished gradually until the fastigium of the process was reached, then increased again.

Cholesterol: Diminished gradually until the fastigium of the process was reached, and then increased again. When calculated on the basis of 100 parts of ether extract it seemed to be increased.

Lecithin: Diminished gradually, then increased gradually as resolution was taking place.

Ash: In some cases an increase took place, but only in a few instances was a very large increase apparent.

Ash constituents: The most characteristic changes taking place in the composition of the ash were an increase in the sodium and chlorin content, a corresponding decrease in the potassium content, and in most instances a decrease in the calcium and phosphoric acid content. In all probability a determination of the chlorin content of the milk, respectively in the ash, will furnish a clue as to whether the milk in question is of pathological origin or not.

A Case of Traumatic Tetanus Successfully Treated With Antitetanic Serum and Lobeline

By F C. ARTOPORUS, D. V. S., Bloomfield, New Jersey

A BLACK gelding, age four years, weight 1550 lbs., had been ill for three days, growing steadily worse, when I was called to see him. At this time he possessed all the characteristic symptoms of a well-developed case of tetanus. On making inquiry as to the source of the infection I was informed that about one month previous he had received a nail puncture in the off front foot, which formed an abscess that later broke and discharged at the heel, and then healed up.

I immediately made a diagnosis of traumatic tetanus. The owner then said that his regular veterinarian had made the same diagnosis early that morning and pronounced the case incurable.

I immediately gave him the treatment outlined in the accompanying chart.

Wednesday June 26, 1912, 8 a. m. Complete trismus, breathing with great difficulty, and paroxysms, muscles rigid.

Wednesday June 26, 1912, 8 a. m. Injected antitetanic serum*, 3000 units and lobeline*, two grains, dissolved in one dram of distilled water.

Wednesday June 26, 1912, 6 p. m. No paroxysms since morning, dyspnea relieved; injected one grain of lobeline.

Thursday June 27, 1912, 8 p. m. Injected antitetanic serum, 3000 units, lobeline one grain. No further improvement.

Thursday June 27, 1912, 6 p. m. No improvement over morning condition; injected lobeline, one grain.

Friday June 28, 1912, 8 p. m. Injected antitetanic serum, 3000 units and lobeline, one grain; no improvement.

Friday June 28, 1912, 7 p. m. Improvement, breathing normal, tried to eat and drink, no paroxysms.

Saturday June 29, 1912, 9 a. m. Injected antitetanic serum, 3000 units and lobeline, one grain. Patient drank a little water and tried to eat hay, but was unable to masticate it, drank about two quarts of bran slop.

Saturday June 29, 1912, 6 p. m. Still improving, injected lobeline, one grain. Ate two quarts of bran mash.

Sunday June 30, 1912. 9 a. m. Injected antitetanic serum, 3000 units and lobeline, one grain drank a half-pail of water, ate two quarts of bran mash and a little green corn fodder.

Sunday June 30, 1912, 7 p. m. No trismus, no paroxysms, breathing normal; was able to move more freely, ate four quarts of bran mash, drank a pail of water and ate a little hay.

Monday July 1, 1912, 8 a. m. Injected lobeline one grain; dissolved four ounces of magnesium sulphate and thirty minims of phenol in a half-pail of water, which he drank freely; ate bran mash and was able to masticate hay.

Tuesday July 2, 1912, 9 a. m. Bowels moving fairly well; considerable improvement.

Wednesday July 3, 1912, 10 a. m. Improvement in his walk; ate well and rested quietly, a general improvement.

Friday July 5, 1912, 10 a. m. Repeated magnesium sulphate and carbolic acid; all stiffness in limbs had disappeared and the animal seemed perfectly normal, with exception of a cloudiness in one eye.

Monday July 8, 1912, 11 a. m. Bowels moving freely; gave two drams of potassium iodide. No improvement over preceding day.

Wednesday July 10, 1912, 10 a. m. Eye clearer; gave magnesium sulphate, eight ounces, potassium iodide, two drams and carbolic acid, thirty minims in a quart of water as a drench; animal ate well and drank well; walked him about for one hour.

Thursday July 11, 1912, 11 a. m. Animal in a normal condition; discharged him as cured; gaining in flesh.

Tuesday July 16, 1912. Returned to light work on farm.

I attribute the success in the treatment of tetanus, to the exhibition of lobelia in full doses and only hypodermically at the onset of the disease. Being an antispasmodic, sedative and relaxant, it acts directly and specifically upon the pneumogastric nerve and also effects promptly all organs supplied by this nerve, i. e., pharyngeal, laryngeal and vagus, and by prostrating or suspending the activity or impressibility of the vasomotor nerves, motor nerve trunks and the peripheral vagi, relieves the fearful convulsions of tetanus, by relieving the nerve tension and irritation caused by the action of the toxin upon the nervous system, thus causing a relaxation of the muscles involved in the paroxysm.

In using fluid extract of lobelia hypodermically you get considerable swelling of the parts and later abscesses, this is overcome by the use of the lobeline dissolved in water.

*Note.—The antitetanic serum used in this case was Behringwerk; the lobeline, Abbott's.

Strongyles of the Horse

By B. F. KAUPP, M. S., D. V. S.

Pathologist Division Veterinary Medicine, Colorado State Agricultural College. Author of "Animal Parasites and Parasitic Diseases," etc.

IT has been pointed out by Prof. Looss, in his research into strongyles of the horse, that there are many species, in fact a group of species represented by what has been known the world over as the Strongylus armatus and Sclerostomum tetracanthum.

Stimulated by the findings of Prof. Looss, in Egypt in which he points out nineteen species formerly represented by the above names, it was determined some two years ago to take up a like study in the Laboratory of Pathology of the Division of Veterinary Medicine of the Colorado State Agricultural College to determine if these varieties named by Prof. Looss exist in American horses.

At the present time I am in position to make only a partial report on this enormous task. Later a supplementary report will be made incorporating many interesting things now under investigation but not yet completely worked out.

In this report I shall follow the classification of Looss.

All subjects autopsied by the writer during the past two years have been carefully searched for parasitisms. It is a well known fact that practically every horse that comes to autopsy is, so to speak, a verminous menagerie. Of these autopsied horses 100 percent were found to harbor many species of strongylus in the large intestines and ninety-two percent were affected by verminous thrombi or aneurism; the number varying from sixteen percent to one hundred percent depending on the locality in which the work was done.

The worms for this work were collected from the opened colon and cecum by lifting them one by one with a pair of forceps and placing them in clear water, later taken to the laboratory and by aid of the forceps to free them from fecal matter, were dropped in alcohol heated to 80° C., which is the boiling point for that spirit at this altitude.

In order to render the worms transparent so that they may later be stained and their internal anatomy studied, glycerine was added at the end of twenty-four hours. First in quantity sufficient to make a five percent glycerine-alcohol, later increased to ten percent, then fifteen percent and then twenty percent, after which they can be placed in pure glycerine without fear of shrinking.

The hot alcohol quickly kills the worms and prevents them from shrinking and they are always straight for study. As soon as the worms are sufficiently transparent they are placed in fifty percent alcohol to remove the glycerine then in a saturated solution of alcoholic eosin for from three to ten minutes, depending on the size of the worm. They are then washed in alcohol, wiped or blotted and placed in beechwood creosote for twenty-four hours at which time they will have clarified sufficiently for study. They may be studied, temporarily in the creosote, or they can be mounted in glycerine jelly or Canada balsam or they may be imbedded in paraffin or celloidin and sectioned for microscopic study.

The Strongylus-Armatus Group

In the group of parasites commonly known under the name of Strongylus armatus I will discuss briefly the following genera: Sclerostomum and Triodontophorus.

Genus Sclerostomum

The mouth-collar is formed by a continuation of the skin and at its upper part is split into a delicate fringe-like crown. See figures 1, 4, 6 and 9 in plate I. The inner part of this mouth-collar rests on the anterior border of the mouth-capsule. The skin is thick. The head is provided with papillae and the four sub-median are marked by a short point composed of the chitinous substance of the mouth-collar and pro-

jecting at the base of the anterior leaf-crown. The fibers of the papillary nerves terminate immediately beneath them. The lateral papillae are not provided with these points and do not project over the collar. See Figures 1, 4, 6 and 9 in Plate I. The inner part of this mouth-collar rests on the anterior border of the mouth-capsule. The skin is thick. The head is provided with papillæ and the four submedian are marked by a short point composed of the chitinous substance of the mouth-collar and projecting at the base of the anterior leaf-crown. The fibers of the papillary nerves terminate immediately beneath them. The lateral papillæ are not provided with these points and do not project over the collar. See Figures 1, 4, 6 and 9, Plate I

The intestine is composed of two rows of epithelial cells, one dorsal and one ventral. These cells are very large and contain large oval nuclei. This is best seen on cross section of the worm.

The digestive tract consists of the following structures: mouth, esophagus, intestine (chyle intestine) and rectum.

The papillae are connected with the central nervous system four of the fibers going to the four lateral papillae and four to the submedian papillae.

The bursa of the male is rather small. See figures 5 and 10 Plate I and figure 17 Plate II. The genital opening is placed at the top of the genital cone on the ventral surface of the body. The two spicules are thin and slender. The vulva of the female is anterior to the anus and in the posterior third of the body.

The male is provided with glands which secrete a gummy substance and is delivered in the region of the caudal pouch and literally cements the pouch to the female during the copulatory act.

This genus has three species, viz: equinum, edentatum, and vulgare. They are usually found in the cecum and first portion of the large colon.

Sclerostomum equinum:—(Strongylus armatus. Strongylus neglectus). This is the largest species of strongylus found in the intestines of the horse. The male measures up to 35 mm. (one and one-half inches) long and an average thickness of 1.25 mm. while the female measures up to 47 mm. (nearly two inches) long and 2.25 mm. in thickness. See figures 2 and 3, Plate I. Three teeth are found within the mouth capsule. The teeth have rounded terminations. See figures 1 and 2, Plate I.

Sclerostomum edentatum:—(Sclerostomum equinum). This is the next largest species of strongylus under consideration. The male measures up to 26 mm. (one inch) long and 1.5 mm. thick. The female up to 36 mm. (one and one-half inches) long and 2 mm. in thickness. The head is distinctly divided from the body. The mouth is cup-like in shape and there are no teeth-like projections. See figures 6, 7 and 8, Plate I.

Sclerostomum vulgare:—(Sclerostomum armatum). The male measures up to 16 mm. (two-thirds of an inch) long and diameter about .75 mm. while the female measures up to 24 mm. (one inch) in length and 1 mm. in diameter. The mouth is slightly cup-shaped with the dorsal aspect more convex than the ventral. See figures 14 to 20. Plate II.

Genus TRIODONTOPHORUS

This genus is provided with three teeth located in the floor of the oral capsule. These teeth are directed toward the opening of the mouth. The genital opening in the female is found a short distance from the tip of the tail. The body is thick with rather abrupt narrowing at both ends. The skin is rather thick with deep transverse markings. Two uteri extend forward from a short vagina.

There are two species of this genus, viz: minor and serratus.

The word triodontophorus comes from the fact that there are three teeth provided in the oral capsule.

Triodontophorus minor:—The male measures up to 13 mm. (one-half inch) long and about .7 mm. thick while the female measures up to 14 mm. (one and one-sixteenth inches) long and .8 mm. in thickness. The body of the female terminates short and blunt. The caudal pouch of the male is rather large. This worm is found principally in the last portion of the colon. See figures 24, 25, and 26, Plate II.

FIGURE

DESCRIPTION OF PLATE I.

1. SCLEROSTOMUM EQUINUM (strongylus armatus). Cephalic extremity. Lateral view. Female.
2. SCLEROSTOMUM EQUINUM. Female. Natural size.
3. SCLEROSTOMUM EQUINUM. Male. Natural size.
4. SCLEROSTOMUM EQUINUM. Cephalic extremity. Male. Dorso-lateral view.
5. SCLEROSTOMUM EQUINUM. Caudal pouch. Male. Lateral view.
6. SCLEROSTOMUM EDENTATUM. Diagonal front view. Head. Female.
7. SCLEROSTOMUM EDENTATUM. Female. Natural size.
8. SCLEROSTOMUM EDENTATUM. Male. Natural size.
9. SCLEROSTOMUM EDENTATUM. Diagonal front view of mouth.
10. SCLEROSTOMUM EDENTATUM. Posterior view of caudal pouch. Male.
11. GYALOCEPHALUS CAPITATUS. Cephalic extremity of female. Dorsal view.
12. GYALOCEPHALUS CAPITATUS. Female. Natural size.
13. GYALOCEPHALUS CAPITATUS. Male. Natural size.

DESCRIPTION OF PLATE II.

14. SCLEROSTOMUM VULGARE. Cephalic extremity. Female. Ventral view.
15. SCLEROSTOMUM VULGARE. Female. Natural size.
16. SCLEROSTOMUM VULGARE. Male. Natural size.
17. SCLEROSTOMUM VULGARE. Caudal pouch. Male. Lateral view.
18. SCLEROSTOMUM VULGARE. Cephalic extremity. Male. Lateral view.
19. SCLEROSTOMUM VULGARE. Cephalic extremity. Female. Latero-ventral view.
20. SCLEROSTOMUM VULGARE. Caudal extremity. Female.
21. TRIODONTOPHORUS SERRATUS. Casting its last moult arriving at mature state. Male. From a thrombus of the anterior mesenteric artery.
22. TRIODONTOPHORUS SERRATUS. Cephalic extremity. Female. Lateral view.
23. TRIODONTOPHORUS SERRATUS. Male. Natural size.
24. TRIODONTOPHORUS SERRATUS. Female. Natural size.
24a. TRIODONTOPHORUS MINOR. Cephalic extremity. Female.
25. TRIODONTOPHORUS MINOR. Male. Natural size.
26. TRIODONTOPHORUS MINOR. Female. Natural size.
27. CYLICHNOSTOMUM LABIATUM. Cephalic extremity. Female. Dorsal view.
28. CYLICHNOSTOMUM LABIATUM. Male. Natural size.
29. CYLICHNOSTOMUM LABIATUM. Female. Natural size.
30. CYLICHNOSTOMUM LABIATUM. Caudal extremity. Male. Lateral view.

DESCRIPTION OF PLATE III.

31. CYLICHNOSTOMUM TETRACANTHUM. Cephalic extremity of male. Dorsal view.
32. CYLICHNOSTOMUM TETRACANTHUM. Male. Natural size.
33. CYLICHNOSTOMUM TETRACANTHUM. Female. Natural size.
34. CYLICHNOSTOMUM NASSATUM. Cephalic extremity. Female. Dorsal view.
35. CYLICHNOSTOMUM NASSATUM. Male. Natural size.
36. CYLICHNOSTOMUM NASSATUM. Female. Natural size.
37. CYLICHNOSTOMUM RADIATUM. Cephalic extremity. Female. Dorsal view.
38. CYLICHNOSTOMUM RADIATUM. Male. Natural size.
39. CYLICHNOSTOMUM RADIATUM. Female. Natural size.
40. CYLICHNOSTOMUM BICORONATUM. Cephalic extremity. Female. Dorsal view.
41. CYLICHNOSTOMUM BICORONATUM. Anterior view. Mouth. Female.
42. CYLICHNOSTOMUM BICORONATUM. Caudal extremity. Female.
43. CYLICHNOSTOMUM BICORONATUM. Male. Natural size.
44. CYLICHNOSTOMUM BICORONATUM. Female. Natural size.
45. CYLICHNOSTOMUM LABRATUM. Cephalic extremity. Female. Dorsal view.
46. CYLICHNOSTOMUM LABRATUM. Male. Natural size.
47. CYLICHNOSTOMUM LABRATUM. Female. Natural size.

DESCRIPTION OF PLATE IV.

48. CYLICHNOSTOMUM ALVEATUM. Cephalic extremity. Female. Dorsal view.
49. CYLICHNOSTOMUM ALVEATUM. Male. Natural size.
50. CYLICHNOSTOMUM ALVEATUM. Female. Natural size.
51. CYLICHNOSTOMUM POCULATUM. Cephalic extremity. Female. Dorsal view.
52. CYLICHNOSTOMUM POCULATUM. Male. Natural size.
53. CYLICHNOSTOMUM POCULATUM. Female. Natural size.
54. CYLICHNOSTOMUM CATINATUM. Cephalic extremity. Female. Dorsal view.
55. CYLICHNOSTOMUM CATINATUM. Male. Natural size.
56. CYLICHNOSTOMUM CATINATUM. Female. Natural size.
57. CYLICHNOSTOMUM ELONGATUM. Cephalic extremity. Female.
58. CYLICHNOSTOMUM ELONGATUM. Male. Natural size.
59. CYLICHNOSTOMUM ELONGATUM. Female. Natural size.
60. CYLICHNOSTOMUM CALICATUM. Cephalic extremity. Female.
61. CYLICHNOSTOMUM CALICATUM. Male. Natural size. Dorsal view.
62. CYLICHNOSTOMUM CALICATUM. Female. Natural size.

STRONGYLES

PLATE I

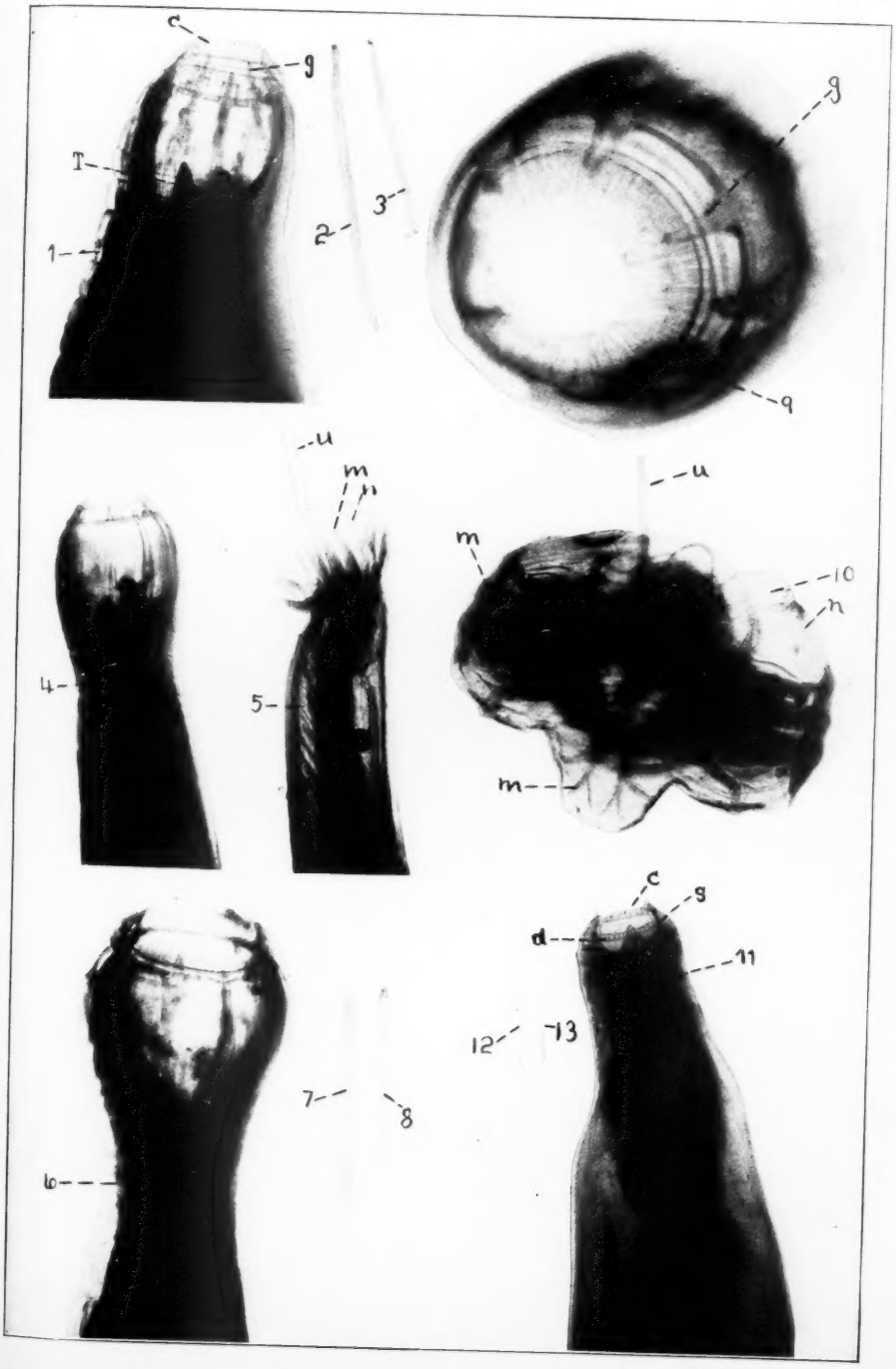
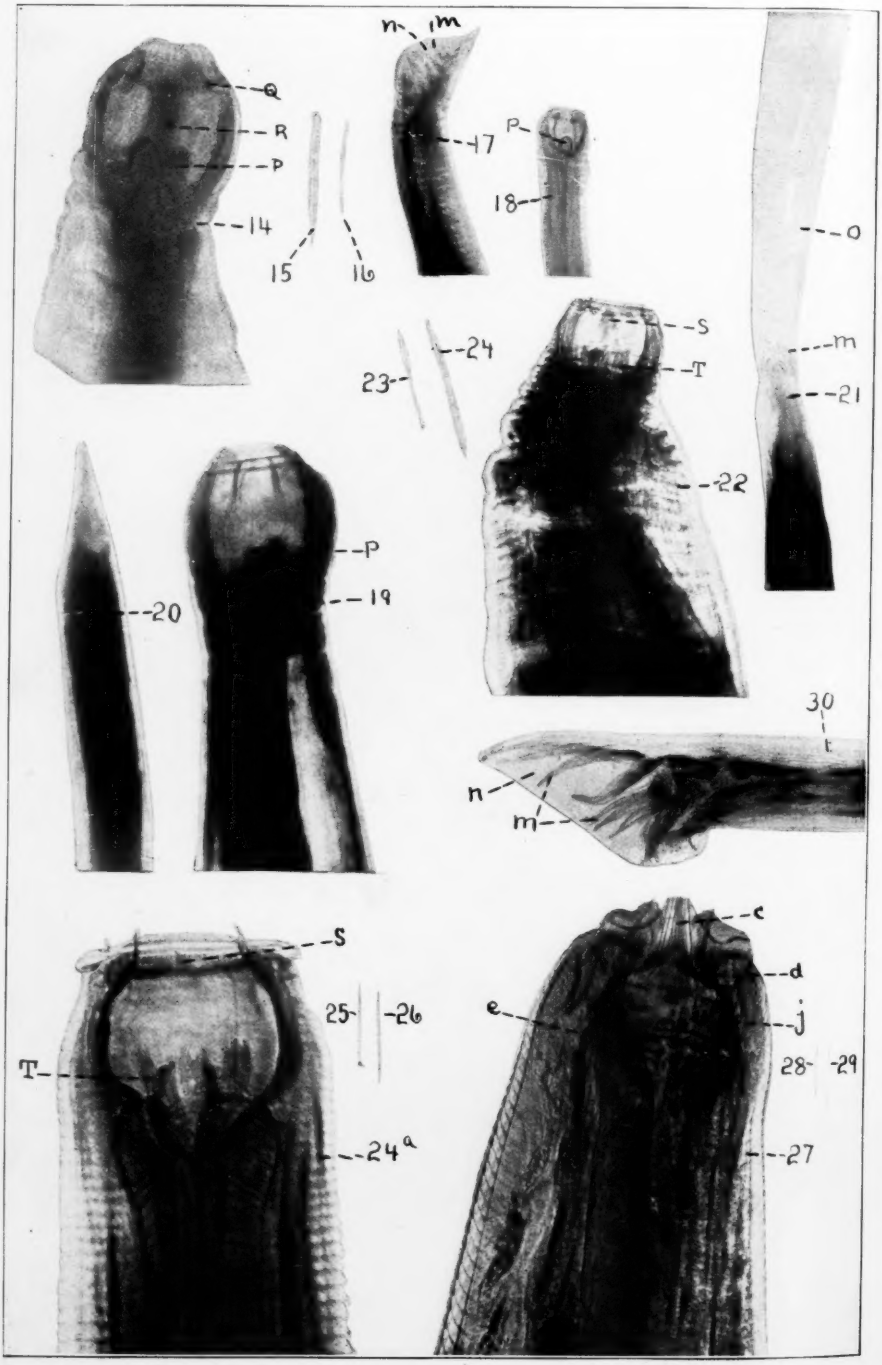


PLATE II

STRONGYLES



STRONGYLES

PLATE III

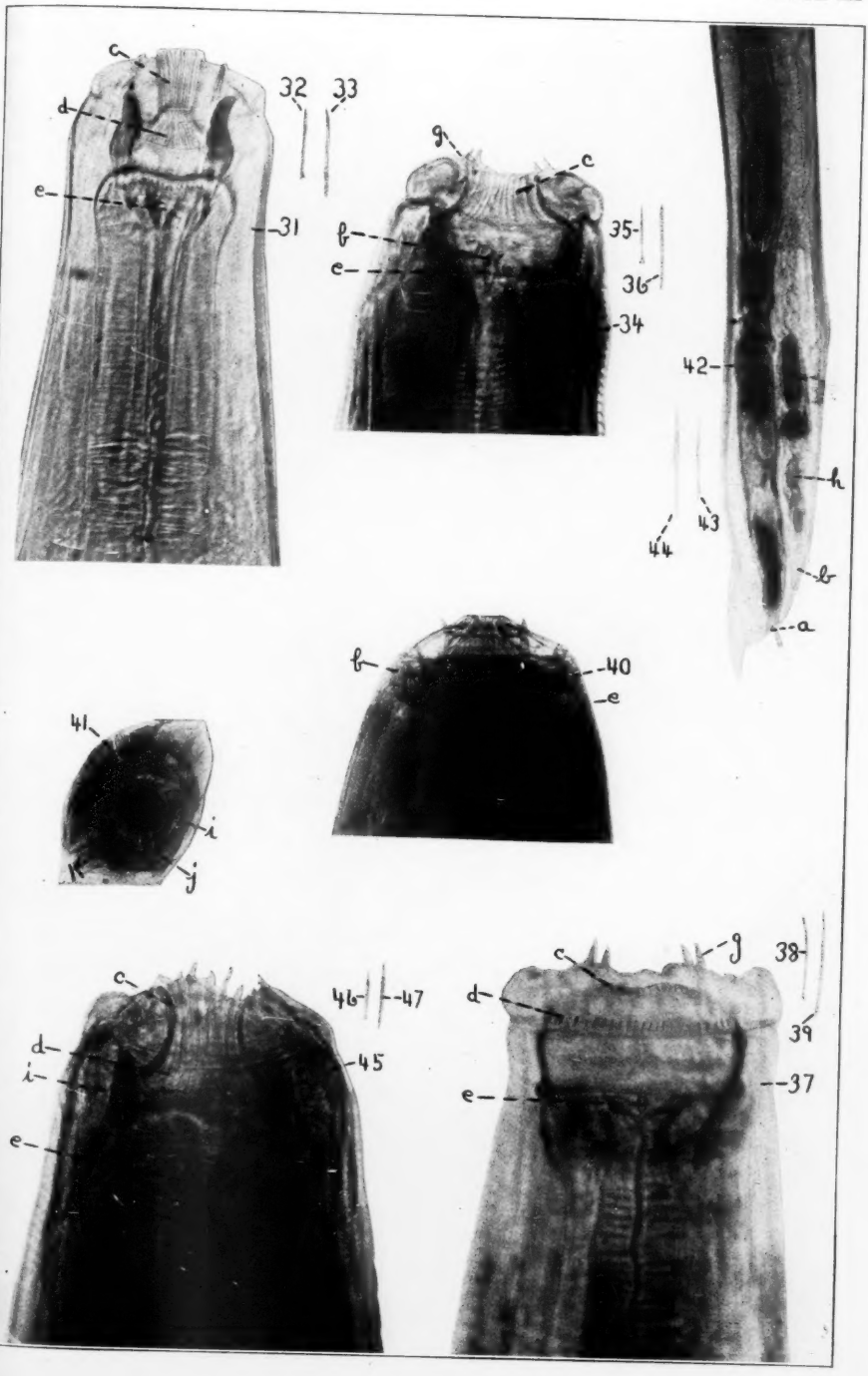
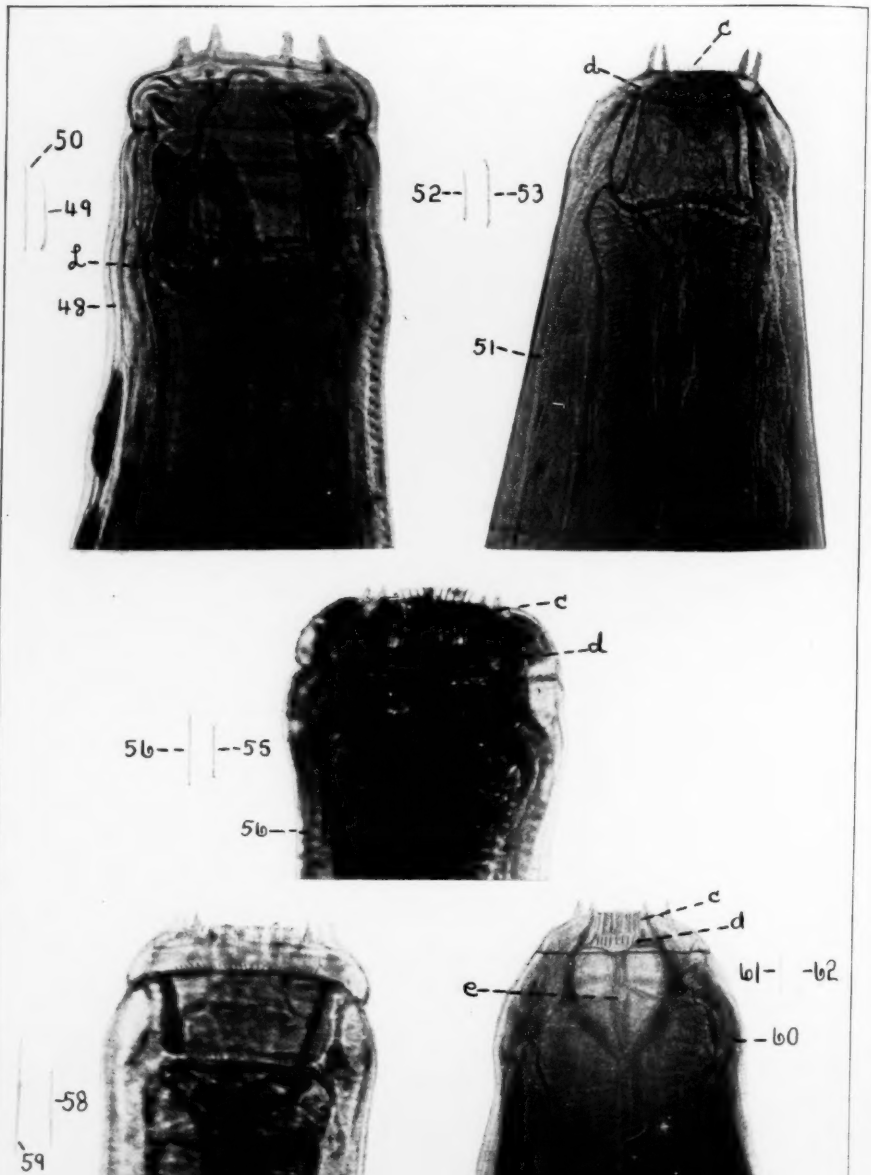


PLATE IV STRONGYLES



KEY TO LETTERS

a—anus	*l*—oesophageal funnel
b—vulva	*m*—rays
c—external leaf crown	*n*—web
d—internal leaf crown	*o*—moult
e—oesophageal gland	*p*—dorsal tooth of mouth capsule
f—orifice of dorsal gutter of mouth capsule	*q*—lateral papillary nerve
g—submedian head papillæ	*r*—dorsal gutter of mouth capsule
h—ova	*s*—lateral head papillæ
i—mouth	*t*—teeth
j—mouth capsule	*u*—spiculæ
k—mouth collar	

Triodontophorus serratus:—The male measures up to 18 mm. (three-fourths of an inch) long and about 1 mm. in thickness and the female 25 mm. (one inch) long and about 1 mm. thick. See figures 21, 22, 23, and 24, Plate II. The worm shown in Figure 21 is taken from a thrombus of the anterior mesenteric artery of an eleven-months-old colt. It is casting its last moult having just arrived at the fully developed state. It is a male worm.

The Sclerastomum-Tetracanthum Group

In the group of parasites commonly known under the name of Sclerostomum tetracanthum I will briefly discuss the following genera: Cylichnostomum and Gyalocephalus.

Synonyms for this group are: Sclerostomum tetracanthum and Strongylus tetracanthus.

Genus CYLICHNOSTOMUM

The cylichnostomum was so named from the resemblance of its mouth parts to a small cup, which the word means.

The general form of the body is stout. The tail of the female is slender and pointed. The body has transverse markings in the skin. The male is provided with a caudal pouch which possesses two spiculae of equal size and shape. The intestine runs straight through the body and is usually visible to the naked eye especially after clarification of the specimen. Looss has apparently proven that the function of the spiculae is one of copulation as he has observed, in at least one case, the spiculae introduced into the inner genitals of the female in a copulating pair. He has also observed that the food of the cylichnostomes is a colorless crumbly more or less coarsely granular substance including to a varying extent particles of all kinds of vegetable debris, pieces of straw, starch granules and often ova and infusoria. Thus it will be seen, that from a study of the intestinal contents there may be some doubt as to whether they are true blood suckers. The writer in his study of more than 300 speciments has noted in one case the ingestion of two ova.

These worms pass through their larval stage in cysts in the mucous membrane of the large intestines. In making a collection of the strongylus for study I find that while the majority of worms are found close to the mucous membrane or between the fecal matter and mucous membrane yet some are incorporated in the mass of partially digested material.

The following species of this genus cylichnostromum have been studied in this laboratory: tetracanthum, labratum, labiatum, bicoronatum, poculatum, calicatum, alveolatum, catinatum, nassatum, radiatum and elongatum.

The probabilities are that one and possibly two species have been found in this state not included in Prof. Looss' monograph. These will be reported on later.

Cylichnostomum tetracanthum:—Length of male 9 mm. (one-third of an inch), thickness .25 mm, female up to 12 mm. (one-half inch) long, thickness .5 mm. Lateral head papillae not prominent, submedian head papilla moderately long. Esophagus short and stout. See figures 31, 32 and 33, Plate III.

Cylichnostomum labratum:—Body slender. Length of male up to 8 mm., female 9 mm. Maximum thickness of male .25 mm., female .33 mm. Head separated from the body by a slight construction. Papillae same as in C. tetracanthum. See figures 45, 46, and 47 Plate II.

Cylichnostomum labiatum:—Length of male up to 9 mm., female 11 mm. Thickness of male up to .33 mm. and female .42 mm. See figures 27, 28, 29, and 30, Plate III.

Cylichnostomum bicoronatum: — Body stout and slightly tapering towards the extremities. Length of male up to 12 mm., female up to 14 mm. Head continuous with the body. Tail of female appears as though it was cut off obliquely. See figures 40 to 44, Plate III.

Cylichnostomum poculatum:—Body delicate and slender. Length of male up to 8 mm., female up to 10 mm. Head not separate from the body. Esophagus long. Lateral head papillae prominent. See figures 51, 52 and 53, plate IV.

Cylichnostomum calicatum:—A very small worm. Body delicate and slender. Length of male up to 6 mm., female up to 8 mm. Head slightly narrowed, esophagus short. See figures 61, 62 and 63, Plate IV.

Cylichnostomum alveatum:—Length of male 10 mm., female 13 mm. Thickness of male, .43 mm., female, .6 mm. See figures 48, 49 and 50, Plate IV.

Cylichnostomum catinatum:—Head slightly thickened, esophagus short and thick. Length of male up to 8 mm., female 9 mm. See figures 54, 55 and 56, Plate IV.

Cylichnostomum nassatum:—Length of male up to 10 mm., female up to 14 mm. Thickness of male up to .3 mm., female up to .7 mm. Submedian papillae moderately long. See figures 34, 35 and 36, Plate III.

Cylichnostomum radiatum:—Length of the male up to 11 mm., female up to 14 mm. Submedian head papillae longer than the nassatum. See figures 37, 38 and 39, Plate III.

Cylichnostomum elongatum:—Length of male up to 13 mm., female up to 17 mm. Lateral head papillae large. See figures 57, 58, and 59, Plate IV.

Gyalocephalus capitatus:—Length of male up to 7.5 mm., female up to 9.5 mm. Body rather slender. Head distinctly separated from the body. See figures 11, 12, and 13, Plate I.

A chemical study of the strongyles shows their bodies to be composed of the following substances: fats, fatty acids consisting chiefly of butyric acid, soaps, mucin, albumoses, purin bases and creatin. A ptomain, a crystalizable alkaloid, an amino-acid and an amorphous substance containing non-protein nitrogen and phosphorus which gives precipitating reactions for an alkaloid. The cuticle contains a protein like substance which has no relation to chitin.

An alcoholic extract of these parasites possesses strong hemolytic properties. The soaps, fatty acids, crystalizable alkaloids and ptomains are active in this hemolytic process. The parasites secrete a lipase capable of digesting the fat contained in horse serum.

Characteristics of the Strongyles

The strongyles draw blood by aid of their chitinous mouth-capsule. This capsule is buried in the intestinal mucosa and in some cases offers quite a resistance to traction in an effort to remove them.

These parasites are provided with neck glands and esophageal glands. The latter are composed of large irregular shaped cells and the body of the gland is imbedded in the esopahgeal muscles as illustrated in the plates. These glands empty into the esophagus and the secretion in all probability is a digestive one.

The neck glands appear as two large spindle-shaped cells located within the perivisceral cavity of the anterior half of the body, and united with the so-called bridge of the excretory system by two longer or shorter peduncles of varying calibre. These glands are provided with excretory ducts which empty on the margin of the buccal lips. It is believed that this secretion has something to do with the prevention of the ready coagulation of the blood ingested by the worm. It has been found by experimentation that these glands secrete a poisonous substance which may interfere with the general health of the infected horse, ass or mule causing an unthrifty condition as well as evidence of injury by a production of an eosinophilia.

As a rule we may say of the larger species of strongylus, that the Sclerostomum vulgare are found principally in the cecum and at times the colon. The Sclerostomum edentatum and S. equinum are found principally in the first portion of the colon. The Triodontophorus minor is found principally in the thickened end of the terminal portion of the large colon. The triodontophorus serratus and the Cylichnostomes are found scattered throughout the cecum and great colon.

The loss of blood caused by myriads of the blood sucking kind amounts to considerable and yet while nearly every horse harbors a greater or less number of the various species here described but few ever show any inconvenience. Just to what

extent the animal becomes immunized to the injurious substances thrown out, some of which is undoubtedly absorbed, is an important question to determine.

Intestinal Strongylosis

I have noted the great activity shown by the wriggling Triodontophorus and S. vulgare when the colon is opened shortly after death of the host. These worms often appear red to pink in color, are thus very active, no doubt the most active blood-suckers of all the multitude of species of strongylus that may infest the large intestines of the horse. I have known infestations with the smaller varieties in young horses where a fatal hemorrhagic enteritis resulted. The feces were blood stained and each discharge from the bowel was loaded with the small worms.

Thus it will be seen that the intestinal strongylosis may result in diarrhea, emaciation, anemia, colic and death. The treatment of the intestinal infestation consists of two drams each of iron sulphate and tartar emetic given on an empty stomach in small amount of chop, once a day for a week. This is followed by a brisk aloetic purge. This treatment should be repeated at the end of a week. The colon content is so massive and the distance from the mouth so great that desirable results are sometimes hard to attain.

As stated before thrombi and aneurisms of the abdominal blood vessels, and especially the great mesenteric artery, are common. I have found these thrombi in young horses, the youngest being eleven months old. In this case the thrombus had formed in one of the large branches of the great mesenteric artery about four inches from its origin. The vessel was not distended and the coagulum, was slightly larger than a pea and contained three worms. One proved to be a Triodontophorus serratus, the posterior extremity of which is illustrated in figure 21, Plate II.

The large intestines of this young horse contained only two species, those of the Triodontophorus serratus and the Sclerostomum vulgare. All other worms examined up to this time for classification from thrombi and aneurisms have proven to be the Sclerostomum equinum. (Strongylus armatus.) One investigator has ventured the opinion that this latter parasite probably passes its larval stage in the abdominal blood vessels.

Thrombosis and Embolism

In those vessels containing small thrombi and which must be regarded as rather recent invasions there is noted an endarteritis with possibly some destruction of the endothelium. Later stages show atheromatous changes and in old aneurisms even areas of calcification. The middle coat shows hypertrophy and inflammatory processes. The outer coat shows connective tissue proliferation.

A vessel wall thus diseased may give way to a more or less extent and sacculation occur. The aneurism now developed may be saccular, fusiform or cylindroid. On the inner side will be found a mass of coagulum adhering closely to the degenerating vessel wall. The larvae may be found in the coagulum with one end extending out into the blood stream or lodged in the walls between the coats or penetrating partially protruding on either side of the vessel wall.

From this coagulum there may break loose at different times, emboli which may produce more or less serious results depending on the size of the embolus and the location of the embolism. There will be ischemia of that portion of the intestine to which the vessel is disturbed, and paralysis of that portion of the digestive tube. The secretions are suspended and thrombi-embolic colic results.

The ischemic portion, at first pale, now becomes dark red, due to the passive congestion. The mucous membrane appears swollen and hemorrhagic infarction occurs. A serous exudate may be present and the organ appears increased in size. This condition favors infection from the bowel and more serious results may follow.

Thrombo-Embolic Colic

Fermentation of the ingesta of this now paralyzed part of the digestive tube may take place. The horse shows colicky pains, lies down and gets up frequently, perspires first in spots later may be covered with perspiration. If rupture of the aneurism takes place during the attack of colic the

animal will be noted to sit up on his haunches, knuckles over in its fetlocks. There will be blanched or pale visible mucous membranes. The extremities are cold. The pulse is weak and thready. If the aneurism be located in the posterior aorta this vessel is more likely to rupture because of the high blood pressure in it.

Bollinger records fifteen ruptured aneurisms as having taken place into the peritoneal sac and three into the intestines.

Additional symptoms noted may be those of looking around at the side, pinched facial expression, passing a few hard fecal pellets later a total suppression of passages. The animal trembles and moves its hind feet uneasily.

Large verminous aneurisms may cause frequent attacks of colic. These are usually brought about by embolism in the small branches of the diseased artery. If the collateral circulation takes care of the part the animal recovers. If slightly more severe the disease may run a chronic course, indigestion and possibly constipation alternated with diarrhea, light colicky attacks, some elevation of temperature, capricious appetite. This condition may finally terminate in recovery or if still more serious marasmus, cachexia and death.

An embolism in one of the smaller vessels may not prove fatal on account of the free arterial anastomosis. It is where more than one vessel is in a state of embolism or larger vessels affected that fatal thrombo-embolic colic results. As an illustration if an embolus should lodge at the trunk of the large faciculus of the great mesenteric artery it would shut off the blood supply to the cecum and death of that viscus result. Or if the embolus should lodge in the first branch of the great mesenteric artery which goes to the floating colon serious results would follow.

The direct cause of death in these cases is probably due to intoxication by absorption of toxic substances from the intestines, from infection of the infarcted area, from cardiac syncope as a result of pain, from absorption of poisonous gases from the bowel, from nervous shock due to the pain, from alteration of blood and disturbance to the circulation, from edema of the lungs brought about by continuous compression on the diaphragm by the distended bowels or from cerebral or pulmonary apoplexy induced by increased arterial tension due to pressure of the distended abdominal viscera on the larger arteries.

Bollinger records a case in which recovery had taken place and later the animal came to autopsy. He records as high as five or six obliterated arterioles and venules in a square centimeter.

There is a possibility that the larger aneurisms interfere to some extent with the normal blood supply to the bowel and account at least in some cases, for chronic digestive troubles so frequently found among horses of all ages and environments.

At least a part of the larger sclerostomes pass their larval stage in small tumors in the wall of the large intestines and possibly in small fecal pellets. These tumors vary in size according to the age of the larva and may attain a size up to that of a hazelnut. These are readily observed at autposy as they push out the mucosa as well as the serous suface. When examined closely especially microscopically it will be noted that they may contain blood coagulum and even pus. A local eosinophilia may be observed as well as hyperemia. The larva merging into the adult stage leaves the tumor to be found free in the intestinal contents at which time a small opening may be observed at the summit of the tumor.

There is no doubt but that these blood sucking worms in the intestinal tract wound the mucous membrane so that this acts as a portal of entry of many harmful bacteria.

The author has recorded three cases of Sclerostomum equinum in the spermatic arteries. Two of these cases were from cryptorchids and one from a "straight" colt.

From the adult intestinal form the ova or embryos pass out to the external world with the feces where if not already hatched they do so in a short time if climatic conditions are favorable. Damp or even wet pastures favor this intermediate stage and parasitisms is more prevalent in horses, asses or mules pastured on such grounds. Thus contaminated food and water serves as carriers of the infection.

Chronic Nephritis in the Dog and Cat*

By PROFESSOR HEBRANT and ASSOCIATE PROFESSOR ANTOINE

CHRONIC nephritis, more commonly called Bright's disease in human medicine, is an affection rarely observed in horses and cattle, while it is quite common in the domestic carnivora, such as the dog and cat. Depending upon our own personal observations, we can say that it is as frequent in the dog as in man, and still more common in the cat.

Because of its incurability and on account of the complications which it may engender during the evolution of other maladies for which the practitioner is called, also on account of the accidents which Bright's disease may lead to when surgical intervention, even of a mild character, is demanded among the patients attacked with it, we believe that it may not be amiss to bring this important disease of the smaller animals once more to the attention of our confrères.

The frequency of chronic nephritis in the dog, and especially in the cat, while acute nephritis is rare, except as an immediate complication of an infectious malady, permits us to assert that the disease is developed directly, and in an insidious fashion without a previous acute stage. It is produced under the influence of repeated autointoxication. The abuse of the meat foods appears to us to be concerned in its pathogenesis. Dogs living in apartments and submitted to a digestive regimen which is too rich in nitrogenous matter, and who are not carefully dieted—for the most part gourmands—generally have a digestive canal which does not functionate properly.

Repeated attacks of indigestion, the alternation of constipation and diarrhea, with which there is a coincident abnormal intestinal fermentation, lead to the production of toxic organic residues which require, when they enter the circulating fluid, a hyperactivity of the depurating organs for their elimination. These organs are chronically fatigued and subject to continuous irritation when the conditions which precede are repeated or prolonged.

The quality of the food given (such as the refuse from hotels) may have a directly injurious action through the products which are developed within them from poorly preserved (decomposing) albuminoid matters.

The cat, on account of the sequestration that is imposed upon it, and the exclusive meat diet which is provided for it, is still more exposed to troubles of the kidneys than the dog. The same etiologic modality presents itself. The proof of the irregular function of its digestive tube is given us by the very frequent state of constipation which is observed in this animal.

From the point of view of pathologic anatomy the kidney of the dog attacked by chronic inflammation belongs in the category of "the little red kidney," or arteriosclerotic kidney.

The little red kidney is the kidney contracted under the influence of an atrophic process; it is recognized immediately by its small volume; it is reddish-brown in color and has a "corded" surface. It contrasts singularly with the big white kidney. It is especially the cortical layer which is reduced in size and it presents nearly always small cysts. These lesions are classical and described in all the works on pathology. Our distinguished colleague, at the school of Lyon, Porcher, some time ago called the attention of the practitioner to these lesions, which he described under the name of "senile kidney," after observing their frequency at autopsies.

The kidney of the cat suffering from Bright's disease, on the contrary, is a white kidney. Its external color is very yellowish, its resistence greater (sclerosis) and its volume sometimes diminished, at other times augmented. A microscopical examination reveals hypertrophy of the interstitial tissue, narrowing of the canaliculi and fatty degeneration of the epithelium.

The symptomatology at the beginning of the disease is almost nothing; chronic

*Translated from Annales de Médicine Vétérinaire, June, 1912, by Dr. A. S. Burdick, Chicago.

nephritis evolves insidiously, and when one is able to diagnose it for the first time it has already been in existence for several months or even years. That is to say, that Bright's disease is not recognized in the dog or cat during its youth, but only during its adult life. There are certain symptoms, however, which are present before this early period, but they are slightly marked or not alarming enough in the domestic animal to attract the attention of the proprietor and suggest calling a practitioner. Such symptoms are habitual acceleration of pulse, increase of arterial tension, moderate oppression, habitual lassitude increased by a meat diet, increased urination, intense itching which forces the animal to scratch itself until it brings blood, cryesthesia (excessive sensitiveness to cold even during hot weather) and slight epistaxis.

When the disease has developed, however, the symptoms are characteristic and always permit of an accurate diagnosis. These are: polyuria, albuminuria, presence of cylindrical casts in the urine, arterial hypertension with hardened arteries rolling under the finger like cords, and hypertrophy of the heart with all its complications.

There are certain accidents or complications which are often present and some of these are usually an occasion for the intervention of the veterinarian. Such are: grave hemorrhages (such as hematuria or retinal hemorrhages producing blindness), edema in various localities (eye, head, scrotum and limbs), dyspnea, often paroxysmal indigestion, vomiting, diarrhea (gastrointestinal uremia), loss of strength, progressive loss of weight in spite of a good appetite, fatigue upon slight exercise, eclampsia due to uremic intoxication, hypothemia, erratic claudications, etc.

In such cases it is useful for the practitioner to know how to correlate the accidents for which he is consulted with the other and true cause.

The evolution of Bright's disease is slow, especially in the cat, of long duration, certain subjects remaining sick for a year or two if some other affection does not carry it away earlier.

This disease is totally incurable. It leads inevitably to death unless some complication brings about this end sooner. The cause of this nutritive breaking down appears to be intoxication by urea or its generating elements, the depurating organs not being able to provide longer for the elimination of the products of body-waste. Many patients who are affected with the disease preserve for a long time the appearance of health and it is particularly among these that an early diagnosis is of importance when, for any reason, these nephritics are to be submitted to operation. They are already toxic on account of the nephritis from which they suffer, and if they are submitted to surgical intervention the smallest surgical wound, however carefully one may try to produce it, however aseptic it may be, always brings in its train reabsorption of extravasated blood and of the germs which may soil the instruments and the wound itself at the moment of its production. We never operate amid surroundings completely aseptic, even the ambiant air depositing upon the hands of the operator, the operative field, and upon the instruments, organisms so infinitely small in number that the resistance of the patient's phagocytes ought to destroy them. Furthermore, the wound is exposed to infection more than in human medicine on account of the difficulty of retaining dressings, and, if it is not infected up to the point of producing fever (observed with greater difficulty, when there was a previous hypothermia) at the least it is slightly soiled and this is too much when the vital resistance is already compromised.

The result is even more to be feared in veterinary medicine where the patients must be submitted to conditions in which infection is easy, because of the place of lodging, the bed, or even the operating room, which are, in spite of all that may be done, far from ideal from the standpoint of asepsis. It is necessary to recognize that in spite of all the precautions which we take to secure the cleanness of our patients, proper lodging, proper bedding, etc., we never obtain the degree of operative asepsis which we desire, and this reduces the number of our surgical successes.

The following reports, which will be found recorded in our hospital book, will

(*Continued on page 520*)

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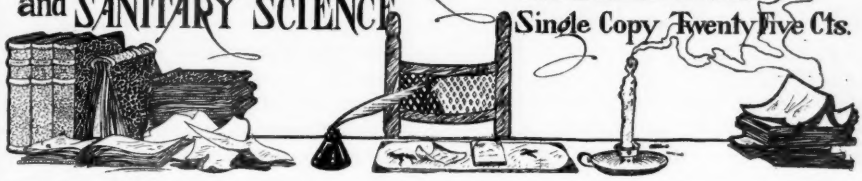

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NOTE—For reasons which explanations might not improve it has been necessary to postpone until next month publication of the discussion on "lameness" by Drs. Joseph Hughes and L. A. Merillat, which was promised for this issue.

Another League Needed

UNDER this heading the *Journal of the American Medical Association* for October 19th contains the following:

"Nebraska newspapers recently contained a news item of interest to stock-raisers and farmers. It was to the effect that many Nebraska farmers have been swindled by impostors selling worthless remedies for the cure of disease in horses and cattle. So serious has the abuse become that the state veterinarian and the governor have discussed ways and means of checking it. A Nebraska physician sends us one of these news items, together with an advertisement of some veterinary 'patent medicines' and says:

" 'I enclose two marked items—their relation is obvious. I hasten to urge on you the necessity of immediate action to establish a League for Medical Freedom for the protection of all horses, mules, and jackasses against the domineering and monopolistic tendencies of veterinary surgeons'."

The item reads like a joke, for which it is probably intended, but its inference is most unfair and unworthy of a great medical journal. The fact is, veterinarians not only did not defraud the Nebraska and Kansas horse owners with veterinary "patent medicines," but they constituted the only force in these states that opposed the sale and use of fake remedies for the cure or alleviation of the "horse plague" so recently decimating the equine population of those states. Druggists and physicians in a great number of instances aided and abetted the "fakers" who appeared in the stricken localities almost coincident with the disease, and, in many instances, were the actual distributors of alleged remedies that they knew, or should have known, were worthless.

Veterinarians continually warned the farmers to have nothing to do with strangers who wished to treat their animals and in a number of instances instituted criminal proceedings against the impostors.

A league or something else more effective is probably needed to protect horses, mules and jackasses or rather their credulous owners, whom the *J. A. M. A.* probably include in the last-named class, but *not* against the "monopolistic and domineering tendencies of veterinary surgeons," who are the stock owners' only real pro-

tectors in matters concerning the health of domestic animals.

LIFE MADE TO ORDER

The great subject of biology, is of course, a science and a study in itself, but it is a science very closely related to the science of medicine, and one about which we should spare no pains to know at least as much as the better educated of our clients.

Life has always been looked upon as something totally incomprehensible to man, but recent investigations have shown that it is not a subject about which we can understand nothing at all.

It has long been known that bees understand the problem of sex, and are able to determine the sex of their young as the exigencies of the swarm may require. Man has never been able to accomplish this result except in some of the lower forms of life where it has been demonstrated that good feeding will produce females and a relative starvation will result in the production of males.

Among all of the lower forms of life and even extending up to the cold blooded vertebrates themselves, a biologist is able to perform many things and accomplish many almost unbelievable results. For instance, he may take out an eye and have a leg grow in its place or cut off a tail and have a body grow on it. He may prick the skin and have a whole cluster of feet grow from this place. On exhibition at the International Congress on Hygiene and Demography recently held in Washington, D. C., was a normal-appearing parthenogenetic ("fatherless"). frog.

Noteworthy as these feats of the biologists are, of equal interest and more importance has been the accomplishments of the Rockefeller Institute and others in preserving life in parts of the animal body after the organism as a whole has ceased to exist.

At the recent meeting of the American Medical Association held in Atlantic City, Dr. Alexis Carrel of New York, who is in charge of the research work at the Rockefeller Institute in that city, told the surgical section, that any time they had occasion to use parts of a human heart, nerves, blood vessels, spleen or some of the smaller glands of the body all they had to do was to order them from the institute and they would be accommodated forthwith. The cornea of the eye, diseased parts of the various bones of the body, cartilages which have given out and need replenishing can be had from this laboratory.

He said that he can make these parts live and grow nine months after the life of the human body from which they have been removed has ceased. For six years these experiments have been going on and now that they have been completed and verified the world of medicine has the opportunity to avail itself of the discovery.

Dr. Carrel began to experiment with the lower orders of animals. A piece of the heart of a chicken pulsated and was alive for as long as 104 days after it had been removed from the fowl and microscopic examination revealed the fact that connective tissue was growing from it five months after removal.

From the chicken he turned to the guinea pig, and from that to the dog; then to the horse, later to the babe and finally to man. In each case there was no failure and step by step he improved upon the media in which he placed these tissues until he has nine methods of preserving life of structures which have been removed from the body. It is necessary to have as many of these as possible, Dr. Carrel explained, for some tissues will grow better in one medium than they will in another.

According to Dr. Carrel, the discovery practically revolutionizes the theories of animal life. It is possible to transplant after death the tissues and organs which compose the body that has ceased to live into other identical organisms. In this transfer no death of the tissues occurs and after they have been made a part of another body the life in them continues as though it had been there from birth.

Among the media which are used to preserve these tissues are isotonic sodium chloride, chloride solution, Locke's solution, Ringer's solution, defibrinated blood serum, confined humid air and vaseline. The color and consistency of these tissues remain perfectly normal six, seven and in some cases ten months after removal. Dr. Carrel said he made microscopic

examinations in every stage of his experiments and proved conclusively that life was present in every instance. He then placed them in cold storage and there they continued to live and grow and were then used to replace diseased tissues in the human body to ascertain if they would grow after they had been transplanted. Clinical reports showed conclusively that they did, so that with the experiments completed and verified it was possible to inform the profession that the institute was prepared to supply them on short notice.

Several of the country's famous surgeons have been using these cold storage tissues for the past few months. Dr. John B. Murphy had occasion only recently to rush an order from Chicago to New York for a cartilage which he wanted to use in a case of knee disease that he was about to operate upon. The cartilage was shipped by express in a tiny refrigerator, arrived safely and was used. The patient recovered the use of his leg and is walking about as though he had never had trouble with it.

This advance in surgery simplifies the methods of transplantations of skin and bone. Surgeons used to graft skin from one living creature to another. They used to scrape the leg of the dog and strap the animal to the patient, but now science has given the surgeon living skin, living bone and living glands that are most essential to life, and all that he has to do is to break the seal of the refrigerator and place the part in position and it grows.

NEW BOOKS

Theory and Practice of Veterinary Medicine, or, as it is called, "Pathology and Therapeutics of Domestic Animals," by Dr. Franz Hutyra and Josef Marek.

The first volume, of the third edition of this great work, has just appeared in English. The Translators being: Drs. John R. Mohler and Adolph Eckhorn, Washington; Dr. Paul Fischer, Columbus, Ohio; and Dr. H. J. Achard, Chicago.

This volume is all that the high talent concerned in its production would lead one to expect of it. And every veterinarian who would keep abreast of his profession must possess it and *read* it.

In German this work went to the third edition in less than five years, where high-class veterinary books are more numerous than here. This is a noteworthy fact and is evidence of the high estimation placed upon the work of these authors by the veterinary profession of Europe. The personnel of the translators is sufficient guarantee of a correct translation and adaptation to the needs of American veterinarians.

From previous announcements American veterinarians have been led to expect much of this work, and it is in no sense a disappointment. Its contents and arrangement and improvements on preceding editions having received extended comment in the April, 1912, issue of VETERINARY MEDICINE, it suffices to give here the scope of Volume I, which covers the subject of infectious diseases, including those due to protozoa and to the higher parasites, diseases of the blood producing organs, diseases of the spleen, kidneys, bladder and circulatory organs and diseases of metabolism.

Published by Alex. Eger, Chicago. Two volumes of 1100 pages and many colored plates each; price, per volume, $7.50. Per set, $15.00 prepaid.

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Human Physiology, including a section on physiologic apparatus by Albert P. Brubaker, A. M., M. D. This is a large, octavo, well-bound, well-printed, handsomely illustrated, textbook for students of human medicine containing nearly 750 pages and nearly 400 illustrations. And while not specially prepared for veterinarians, contains a vast amount of general information on the subject pleasingly presented. That the work has already gone to the fourth edition speaks much for its usefulness in a field where works on this subject are plentiful. It is a handsome library volume of low cost and one all veterinarians will find at least occasionally useful.

Published by P. Blakiston's Son & Co., Philadelphia. Price $3.00 net.

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Principles of Microbiology.—By V. A. Moore, B. S., M. D., V. M. D., Professor of Comparative Pathology and Bacteriology and Director of the New York State

Veterinary College. This work is for the use of beginners in study of bacteriology and handles the subject in the usual thorough and comprehensive manner of the author.

The work follows the usual plan of those who teach the subject of bacteriology in its broad sense and will undoubtedly prove useful as a textbook in veterinary colleges. It is somewhat elemental and does not and of course could not, within the limits of its size, contain a complete record of the advanced knowledge on the subject one would at first thought expect from an author who has the information on this subject that is possessed by Doctor Moore.

The bibliographic references are very full and complete, giving the reader who is so disposed an opportunity to pursue any subject of which the book treats as far as he likes.

Such adverse criticism as the work deserves is chiefly in minor matters and those not directly related to the subject of microbiology. For instance, we find the statement that "it (the thermo-cautery) not only destroys the organisms but promotes granulations," with which surgeons will hardly agree. Under the subject of practical disinfection the use of the spray pump for applying the disinfectant solution is not mentioned and the usefulness of the gasoline blow-torch in stable disinfection is entirely overlooked. The statement that a pig inoculated with 2 Cc. of virulent blood will develop hog-cholera "in about ten days" leads one to believe the authors experience has been with different strain of hog-cholera virus from that found in the great hog-raising section of the Middle West. The intradermal tuberculin test comes in for but little description and less endorsement and American veterinarians are not given the credit that is due them for the work that they have done with this test.

The very brief description of bacterins, with the omission of directions as to their proper manufacture and an evident lack of faith in their efficiency is a disappointment. Here is a product to which veterinatians are just now giving more attention than to all other biologic products combined, and yet the author goes back to the days of its introduction by Wright in 1903 and 1904 for the facts that he gives and the conclusions that he draws.

As a whole the work is a scholarly one, well written, in choice, forceful English. The division into numerous short paragraphs with attractive heads and the excellent mechanical work contribute much to the convenience and pleasure of the reader.

Cloth bound, 507 pages, 101 illustrations. Published by Carpenter & Company, Ithaca, N. Y. Price $3.50 net.

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Veterinarian's Handbook of Materia Medica and Therapeutics by D. H. Udall, B. S. A., D. V. M. Professor of Veterinary Medicine and Hygiene, New York State Veterinary College.

The author has condensed into this little volume of pocket size information on a larger number of subjects including not only Materia Medica with descriptions, uses and dosage of drugs, and The Treatment of Disease, but also brief sections on Weights and Measures, Table of Solubilities, Symptoms and Treatment of Poisoning, Administration of Medicine, Obstetrical Tables, Age Tables, Physiological Tables, Veterinary Hygiene, Clinical Diagnosis, and Shipment of Tissues.

The treatment given for diseases is what we may class as expectant—rather than aggressive, as regulation rather than new or progressive, as conservative rather than radical. This lends dignity and authoritativeness to the work but detracts from its interest.

The book reflects the scholarly training and scientific attainments of the author and is useful for the information which it contains, and for the further study of the subject to which it is bound to lead the reader.

Bound in flexible leather, 177 pages. Published 1912 by Carpenter and Company Ithaca, N. Y. Price, prepaid $1.75 net.

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A Manual of Pharmacy for physicians by M. F. DeLorme, M. D., Ph. G. This little volume deals with the subject of pharmacy from the viewpoint of the user of drugs and while writtern primarily for the use of physicians, is admirably adapted

also to the needs of veterinarians. The subjects discussed are:

Pharmacological definitions, Authoritative Treatises, Weights and measures, Apothecaries' or Troy system, Metric or decimal system, Drop Table, Measure Equivalents, Prescription Latin, Prescription writing, Latin phrases, Abbreviations, Illustrative Examples of Prescription Writing, Pharmaceutical Processes, Pharmaceutical Preparations, Preparations used Internally, Preparations used Externally only, Incompatibility, Typical Incompatible Prescriptions, List of Official Drugs with Doses and Synonyms, Diagram of Solubility of salts in water, Table of Solubility of commonly employed chemicals, List of Potent Drugs with maximum dose, Table of thermometric equivalents, official alkaloids and their doses, Coloring and flavoring agents, Proprietaries versus U. S. P. and N. F. preparations.

Third edition, cloth bound, 222 pages, 19 illustrations, published by P. Plakiston's Son & Co., 1012 Walnut St., Philadelphia. Price $1.25 net.

EXPERIMENT-STATION AND OTHER PUBLICATIONS

Round Worms of Domestic Swine.—Bureau of Animal Industry, Bulletin 158 by W. D. Foster, Zoological Division. The almost universal occurrence of round worms in swine has led most veterinarians to regard their presence as unimportant to the health of the animals; but this view is probably fallacious for any species occurring in large numbers as many of them frequently do occur, or for others which are undoubtedly injurious to a greater or less extent wherever found.

This bulletin deals chiefly with two genera of the filariidae—*Arduenna* and *Physocephalus*—which have recently attracted considerable attention in connection with federal meat inspection.

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Action of Anthelmintics on Extraintestinal Parasites.—Bureau of Animal Industry, Bulletin 154 by Ransom and Hall, Zoological Division. This bulletin gives a critical review of the literature on the subject and a record of some experiments of the authors in treating extraintestinal, somatic parasitisms; particularly hepatic distomatiasis and cerebral teniasis.

The conclusion of the authors is: The location of metazoan parasites often makes surgical treatment impossible, dangerous or unprofitable. Adequate methods of medicinal treatment would have a great medical and economic value as well as scientific interest. The present state of our knowledge does not warrant any conclusion other than this, that a great amount of additional work is necessary and *desirable*.

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Studies on the Biology of the Texas Fever Tick.—Bureau of Animal Industry, Bulletin 152 by Graybill and Lewallen, Zoological Division. A continuation of B. A. I. Bulletin 130 discussed at some length in the pages at the time of its publication.

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Methods of Exterminating the Texas Fever Tick.—U. S. Dept. Agriculture, Farmer's Bulletin 498, by H. W. Graybill, Zoological Division, B. A. I. Gives directions for the practical application of the knowledge gained in the investigations recorded in Bulletins 130 and 152 and other information on the subject.

—

Ancestry of Domesticated Cattle.—Reprint from the twenty-seventh annual report, Bureau of Animal Industry, by E. W. Morse, Office of Experiment Stations. A scientific article going deeply into the subject of the immediate and remote ancestry of cattle.

—

Treatment of Bovine Tuberculosis.—By N. S. Mayo, Bulletin 199, Virginia Polytechnic Institute, Blacksburg. Considered as a whole this is the most serious authoritative arraignment of the tuberculin test that has come from any of its friends. The findings in this test substantiate the repeated statements of Dr. V. A. Moore of New York and others that the greater disadvantage in the use of tuberculin as a diagnostic agent is its failure to indicate tuberculosis in a very appreciable percentage of the cases where it is used and that it thus leaves tuberculous animals, spreaders of the disease, in herds supposedly free from tuberculosis. This matter is of great

importance and a copy of this bulletin should be in the hands of every veterinarian.

—

Hog Cholera and its Control.—By M. Ray Powers, Bulletin 168, South Carolina Agricultural Experiment Station, Clemson. A description of the recent outbreak of hog cholera in South Carolina, which was the worst in its history, symptoms of the disease, sanitary measures necessary in its control and the method of producing antihog-cholera serum.

—

Ticks and How to Destroy Them.—By M. Ray Powers, Circular 6, South Carolina Agricultural Experiment Station, Clemson. Treats of the subject indicated in the title.

—

Tuberculosis in Dairy Cattle.—By E. M. Ranck, Circular, Mississippi Agricultural Experiment Station, Agricultural College. To the report of the International Commission of the American Veterinary Medical Association on the Control of Bovine Tuberculosis, the author adds suggestions of his own pertinent to conditions in Mississippi.

—

Farm Poultry Houses.—By Davidson and Lippincott. Bulletin 132, Iowa Agricultural Experiment Station, Ames. This bulletin gives full, detailed directions for the construction of poultry houses suited to every farm, with complete drawings for the buildings described.

—

Directions for Vaccinating Against Hog Cholera.—By F. B. Hadley, Circular 39, Wisconsin Agricultural Experiment Station, Madison. Deals with the preparation of antihog-cholera serum and its use.

—

Diagnosis of Contagious Abortion in Cattle by means of the complement fixation test by F. B. Hadley and B. A. Beach, Wisconsin Agricultural Experiment Station, Madison. A brief review of the history of contagious abortion in Wisconsin and elsewhere with a discussion of its importance and a description with colored illustrations of methods of diagnosis by the complement fixation.

Care of Milk in the Home.—By Richard and Parker, Circular 162, Illinois Agricultural Experiment Station, Urbana. A description of the appearance and keeping qualities of clean milk and a suggestion for its care in the hands of the consumer.

—

The Veterinarian in Sanitary Milk Productions.—By Cassius, Harvard, Ill., Veterinarian (at the time the article was written) Borden's Condensed Milk Company, reprint from *The Cornell Veterinarian.* A discussion of the problems to be met in the production and marketing of pure milk and the services a properly qualified veterinary sanitary officer can render to this end, with particular stress laid upon the difficulties in the way of handling the tuberculosis problem.

—

Glanders and Farcy in Man and Horses.—By F. G. Atwood, New Haven, Conn. An illustrated pamphlet on the subject, another step in the author's pursuit of his political enemies in Connecticut and in his efforts to improve the livestock sanitary regulations of his State.

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Licensed Veterinarians in Pennsylvania.—Department of Agriculture, Bulletin 227, Harrisburg, Pennsylvania. Gives an up-to-date list of the licensed veterinarians of the state both alphabetically and by counties. The name, address, and school from which each was graduated is given. It may be obtained from State Veterinarian C. J. Marshall.

TO THE VETERINARY PROFESSION OF AMERICA

The next meeting of the American Veterinary Medical Association to be held in New York City, September 1–5, 1913, will be an epoch-making event in the history of our organization. This gathering will celebrate the fiftieth anniversary of the greatest veterinary association in the world, and should represent an index of the growth and progress of our profession in America.

The remarkable strides with which veterinary science has advanced in the past decade, and the general recognition which it has attained in its progress, go hand in

hand with the growth and development of the American Association. All the measures looking towards the advancement of the veterinary profession in America have always been materially and morally supported by this Association, and one cannot help but regard it as the highest power in our struggle for greater recognition.

State legislative measures concerning the betterment of the veterinary profession have been invariably advocated and aided by the Association; its stand for higher education has been of incalculable value in producing the present high standard in our veterinary colleges. The determined effort to obtain rank for the veterinarians in the United States Army is gradually nearing success, and this has been due almost entirely to the emphatic stand and work of the Association.

Thus, it is readily apparent that the American Veterinary Medical Association has been and will continue to be the pioneer in all of our struggles. "Progress" is and will be its by-word, and we shall soon see the day when members of the veterinary profession will be honored like the members of our sister professions.

The remarkable success of the American Veterinary Medical Association during its fifty years of existence can be well accredited to the devotion and enthusiasm of its members. They have always shown a willingness to throw themselves into any struggle for the benefit of the Association and profession without consideration of the odds against them.

Most members of the veterinary profession are cognizant of the advantages which they now enjoy through the work of the A. V. M. A., and year after year records are broken in the enrollment of new members. It is only natural that the strength and influence of an organization are in direct proportion to its membership.

There are in the United States and Canada thousands of veterinarians eligible to membership in the American Association, and with the prestige and advantages that such an affiliation affords, it is surprising that at least a large proportion of them do not avail themselves of this opportunity. It should be the duty of every member of the Association to approach his eligible colleagues and point out to them the advisibility of becoming members. With such concerted efforts it would not be at all difficult to bring our membership, which last year rose to over 1400, to at least 2000 at the meeting in 1913.

In order to reach all those who may desire to join the Association it would probably be best for each state association to appoint a committee on A. V. M. A. affairs, as has been done by the California State Veterinary Association. Secretary Marshall or I will gladly supply such committees with membership blanks, and they could be sent out by the committees to all who are eligible to membership. The applications of those who desire to become members could then be approved by the President and Secretary of the state organization, which is now required by the rules of the American Association.

This ruling will necessarily increase the membership of state associations as applicants must be members in good standing of their respective state organizations in order to obtain the required endorsement of the above-mentioned officials. In consequence the state associations should reciprocate by assisting in the procurement of eligible members for the general body.

The approved applications should afterwards be handed to the Resident State Secretary of the A. V. M. A., for transmission to Secretary Marshall.

Yours fraternally,

John R. Mohler

President, A. V. M. A.

CONTAGIOUS inflammation of the eyes of bovines. (Deutsche Landwirtsch. Presse, 1912, p. 28.)—In various parts of Westphalia, Germany, a bilateral contagious inflammation of the eyes of bovines, especially young animals in pasture, was noted during the months of July and August. The animals avoided the light, lachrymated, had reddened conjunctiva and blennorrhoea. The cornea later became milky white and in some instances had yellow abscesses the size of a bean. Panopthalmia and Macula corneæ often were present after the other processes had ceased.

Abstracts From Foreign Publications

Translated by JULIUS A. JESSEN, D. V. M., Irwin, Iowa

EXPERIMENTAL AND THERAPEUTIC VALUE OF SCARLET DYES

SCARLET dyes were first made use of by Fischer for dissolving atypic growths of epithelium. Later they were therapeutically applied by Schmieden. Volumes of literature have developed as a result of the work of these two authors. Their findings are critically repeated by Prof. Schmieden and Dr. E. Hayward, (Deutsche Zeitschrift für Chirurgie, Vol. 12, No. 4–6, P. 46) in the light of personal experience. The authors have come to the conclusion that scarlet "R" and its component amidoazotoluol have acquired a permanent place in therapy for rapid epitheliation of granulating areas.

They find their therapeutic usefulness to be principally in surgery and in dermatology next in ophthalmology and otology. In experiments on animals the scarlet dyes have been found to be beneficial in dissolving atypic growths of epithelium.

Development of mitosis and locomotion of ganglionic cells of the retina have been proven by the action of scarlet red for the first time. Attempts to produce epithelial growths of parenchymatous organs have terminated resultless.

THROMBOSIS ON THE POSTERIOR VENA CAVA OF THE OX

To the two cases of thrombosis of the posterior vena cava heretofore reported, Chausse, (Bull. de la Soc. centrale de Méd. Vét. P. 55,—1912) has recently added a new one, in which the condition was discovered upon slaughter in a ten-year-old Dutch cow, which had never before shown a sign of sickness. In the region of the liver the vein was converted into a strong cord for a distance of from 15 to 20 cm. (six to eight inches), in the neighborhood of which a slight odor existed. The wall of the vessel was much enlarged by connective tissue and in the center of the vessel only was fibrin found. The veins leading from the spigelian lobe and the upper lobe of the liver were also obliterated.

The cause of the condition in this case was a foreign body, which had worked forward from the stomach to the vena cava, thus resulting in thrombosis. A canal with a diameter of from 3 to 4 mm. (one-seventh of an inch) was found to contain a stinking pus, its walls being blackish in color. This canal, presumably through which the foreign body had passed, led to the center of the vessel where an abscess containing fetid pus was located. The foreign body itself could not be found.

RELATION OF AVIAN TO MAMMALIAN TUBERCULOSIS

Recently there have been various experiments and observations made regarding the relation of the tuberculosis of poultry to tuberculosis of other domestic animals, which in part offer new points for consideration, although in general one may say, that the difference between the two types of tuberculosis is not an absolute one, as most bacteriologists have for a long time been inclined to suppose. De Jong (Revue générale, 1911, No. 210, p. 278), who was the first to approach the question, recently found in a rabbit, which was infested with tuberculosis of the type Laennec, a bacillus which upon growing yielded a culture whose characteristics were exactly the same as those of the bacillus of mammaliae.

Assistant Bang (Copenhagen) reports that he has isolated avian tubercle bacilli from a rabbit which had become affected through natural infection. The rabbit must therefore be ranged among those animals that are susceptible to both types of the tubercle bacilli. Moreover, the author isolated a small-rod form from a calf with inherited tuberculosis, which, when transmitted to a guinea pig produced all lesions of the type of Villemin, and whose cultures carried an absolute picture of the avian bacillus. The difference between the two organisms is therefore only a slight one.

It is also interesting to note that Weber and Befinger have demonstrated avian

tuberculosis in a hog, which could also be confirmed by the author. Bearing these facts in mind, one must necessarily conclude that the tuberculosis of poultry constitutes a danger for other domestic animals, and through them, or directly also for human beings. It therefore appears that poultry should be included in meat-inspection (Annals de l' Inst. Pasteur, Nov., 1910, p. 895).

Danger for the human must also be supposed to be present on the ground that on the other hand the tuberculosis of the human is capable of infecting poultry, as Darmaguar was able to prove (Deutsche Tierärztl. Wochenschr. 1910, p. 196).

Supported by the above observations the author proceeded to investigate further as to whether the chronic hypertrophying enteritis (Johne's disease) of the ox, which is also designated as pseudo-tuberculosis, is of a tuberculous nature. Bang (and previously Johne and Frothingham) attempted to employ the avian tuberculin as a diagnostic means in chronic infectious enteritis of the ox.

It was found that healthy cattle did not react to avian tuberculin, while those affected with enteritis did. 'The latter behaved as do tuberculous cattle when subjected to the tuberculin test, however the reaction was often inconstant. Bang therefore does not consider this chronic enteritis as of a tuberculous nature, since cattle fed on avian bacilli always developed tuberculosis and chickens fed on enteritic material were found exceedingly resistent.

INVESTIGATIONS OF INFECTIOUS OSTEITIS AND OSTEOMYELITIS OF THE OX AND HORSE

After considerable investigation, Dr. Alfred Baumgartner, District-Veterinarian at Interlaken, Switzerland (Schweizer Archiv. für Tierheilkunde, Vol. 53, No. 3), has come to the following conclusions:

1. In the horse and the ox there exists a very painful osteitis and osteomyelitis, brought about by the bacillus necrophorus alone, or in symbiosis with a gram-positive coccus.

2. The disease manifests itself by a lasting disturbance in locomotion, in which the most pronounced symptoms are a supporting-leg lameness, increased pulse-rate, some fever, with well-maintained appetite.

3. In some cases abscess-formation takes place.

4. The disease takes on a very pronounced destructive character in the bones, without the production of reactive osteophytes growth of bone is therefore never perceptible.

5. The course of the disease is usually a chronic one of long duration.

6. Iodine preparations have been proved to contain outstanding curative properties.

RELATION OF THE THYMUS GLAND TO GROWTH OF THE ANIMAL

As a reult of considerable experimenting D. N. Paton (Deutsche Tierärztl. Wochenschrift, No. 31, 1912), has found, that the removal of the thymus glands delays the growth of the testicles of young guinea pigs weighing 300 gm. The simultaneous removal of the thymus gland and the testicles of young guinea pigs checks the growth of the animal, while the removal of either, the testicles or the thymus gland, alone has no influence on their growth.

Female guinea pigs, from which the thymus gland is removed in youth, become pregnant at the same time as normal animals. Unlike castration of the male, oophorectomy neither alone nor in connection with the removal of the thymus gland seems to have any influence upon the growth of immature animals.

The results show, that the removal of both, the thymus gland and testicles has an influence upon the growth of immature animals, and that the removal of either of these organs has no material effect upon the general growth of the animal.

INFLUENCE OF CHLOROFORM-NARCOSIS UPON THE NUMBER OF RED BLOOD CORPUSCLES

In experiments on twelve horses, eight dogs, five cats and five sheep, S. P. Machetin (Zeitschrift für wissenschaftl. and prakt. Veterinärmedizin, Vol. 4, No. 2; publ. by the Veter. Institute at Dorpat, Germany), used the chloroformum officinale and the chloroformum a chloral to determine their hemolytic properties.

Degeneration of blood caused by the action of chloroform could be determined by different methods: By means of counting (Thoma-Lyon) and the hematokrit-

method (Hédin-Brix), but simultaneously also by determination of hemoglobin and iron (Jelles). In connection with these observations he also determined the alkalinity (Engel) and the specifiic gravity (Hammerschlag); further by examination of the urine for albumin (Esbach), gall-pigment (Jelles) and hemoglobin (Heller).

On all horses that were chloroformed a hemolytic action could be observed without exception. A decrease of the hemoglobin and iron in the blood could be recorded, not only during the narcosis, but also during the first few days afterward. A normal condition of the blood was not observed until five days after the narcosis.

A passive diminition, followed by an increase in the number of erythrocytes up to, and even above normal could be observed by the count-method.

A decline in the alkalinity of the blood could be noticed, not only during the narcosis, but even during the first day afterward, returning to the normal on the second or third day.

The specific gravity of the blood was raised during three days and accompanied by a leukocytosis, which was lost gradually during the following days.

Similar results were obtained in dogs, differing only in that a considerably stronger hemolytic effect of the chloroform was observed.

The results of the experiments on cats and sheep did not differ materially from those already mentioned. In passing it may be interesting to mention that all sheep used in the experiments died of bronchopneumonia, following the anesthesia.

ETIOLOGY OF INFLUENZA (PINKEYE, ACCLIMATION FEVER, ETC.)

By Basset, Recueil de Med. Vet. d' alfort, Sept. 15, 1911.—In spite of the fact that there has been a great deal of work done in the investigation of this disease, its nature is not yet understood; but on the contrary investigations of it seem to lead to more puzzles than ever, in that the scientists are not even unanimous as to the diagnosis of the disease.

The chief symptoms of influenza are its contagiousness, fever, fatigue, redness of the conjunctivae and a more or less pronounced odor of the conjunctival discharge. The real and primary cause of the disease is as yet unknown.

For a time it was generally believed that a streptococcic infection was the cause of the influenzal diseases of horses. Later Liguiere advanced the theory that the causative organism belongs to the pasteurellose group, but this is refuted by experimental criticism. Liguiere argues that the fact that as a rule the pasteurella is not found in the sick animals, on the assumption (which he believes correct) that they leave the body after having caused the disturbance. That a pasteurella disappears out of the organism so quickly after damaging it sufficiently to kill it, cannot be the case.

The effect of different organisms of the pasteurellose group differs markedly; one may enter the organism without causing any harm whatever, while another may cause a passive disturbance, and again a third may be destructive by causing septicemia, in which case finding the pasteurella in the blood at all stages of the disease may be considered a certainty. The author therefore came to the conclusion that the study of influenza must again be taken up anew, whereupon he has proven the following by considerable experimentation:

1. The disease may be transmitted by inoculation.
2. It is caused by a filtrable virus.

From a horse suffering with influenza Basset has under aseptic precautions took 100 Cc. of blood, which, after defibrinating, he injected into the jugular vein of another horse. The latter developed characteristic, peracute influenza on the fifth day, of which it died on the eighth. At frequent intervals during the entire course of the disease Bassett prepared plates containing 22 Cc. each, in none of which did a growth of organisms occur. The observations made on this horse led to the presumption that the cause of the disease must be a filtrable virus. To prove this the author filtered 50 Cc. of blood with 500 Cc. of physiologic salt solution through a Berkefeld filter. With this filtrate, which, by placing upon plates produced no visible growth, he injected two horses, giving them 200

Cc. each. One of these horses contracted typical influenza, of which it, however, recovered. The blood from this horse produced no cultures when plates were prepared from it.

The other horse only showed a slight rise in temperature, which fact led the author to presume, that it had been redered immune to the disease by having passed through an attack of it and recovered, earlier in life.

The results of the experiments may be summarized as follows:

1. The inoculation of typhous blood which had been filtered through a Berkefeld filter had caused typical acute influenza in another horse. The period of incubation lasted three days.

2. Recovery from the disease produces immunity in horses.

OVINE CASEOUS LYMPHADENITIS (ADENITIS CASEOSA OF SHEEP)

By G. Morsel, Sant-Etienne (Journ. de Med. Vet., Sept., 1911).—This disease manifests itself by abscess formation in region of the lymph glands. The mediastinal, bronchial and sub-parotid lymph glands are the first to become affected.

The disease occurs most frequently in sheep of about one year of age. The sex seems to have no influence upon the frequency of the disease, but the breed has considerable influence upon its prevalence in that from 15 to 20 percent of the sheep from the Damphine become diseased, while the disease is very rare among Auvergue sheep. Among sheep that are sprightly and healthy, and running with the herd one may find upon slaughter large abscesses.

The hide of affected sheep is found to be smooth, the temperature normal, and very little pain present. A spontaneous evacuation of these abscesses occurs very late in the disease, when gradually a wrinkled funnel shaped scar forms. The abscesses are composed of a dense fibrous capsule which contains a greenish-white pus of the consistency of thick milk. When the lymph node helps to form the capsule of the abscess its subsurface is found to be granulated. Upon microscopic examination of the pus large micrococci are observed, either singly or in pairs, or in groups, which may be stained easily with the usual anilin dyes, as well as with Grams solution. The author has sought in vain the club forms, described by Preisz-Nocard.

The micrococci form a gray ribbed veil in Martin's bouillon which, however, remains clear. The intestinal lymph nodes usually remain normal, are seldom enlarged and seldom contain the micrococci. The author therefore believes we are justified in concluding that a local infection through an abrasion of the hide takes place in most instances. Such an abrasion seems to be usually and very likely brought about by bites from shepherd dogs, which either inoculate the micrococci direct with the saliva, or facilitate its entrance into the wound with dust or feces. The author examined the saliva of twenty dogs, and found the micrococci represented in eight of them.

A wether, which had received 5 Cc. of a culture for five successive days, when slaughtered after fourteen days showed a very slight swelling, redness and the micrococci present in only one intestinal lymph node. Another wether received 1 Cc. of the culture subcutaneously and suffered a very severe attack of the disease, which set in twelve hours after the injection and necessitated its destruction in three days. The parenchyma of the lymph glands showed marked septicemic changes and contained the micrococci in large numbers.

Morel advises the filing of the incisors of the dogs for the prevention of ovine lymphadenitis. Treatment consists of the early evacuation of the abscesses by excising them.

IOWA VETERINARIANS DEDICATE THEIR NEW STATE COLLEGE BUILDINGS

The annual meeting of the Iowa Veterinary Association will be held in the new building of the Veterinary Department of the Iowa State College at Ames on November 12, 13, 14. This will afford an opportunity for the Iowa veterinarians to visit these magnificent new buildings, which should be neglected by no one.

WORLDS WORK in Veterinary Science

A digest of all the Current Literature of Comparative Medicine

By Dr L. W Fetzer Washington, D.C.

In regard to some vaccine prepared by a new method against swine plague and hog cholera. Dr. Krafft (Berlin. Tierarztl. Wochenschr., 1912, Vol. 38, No. 15, pp. 261–266).—This article reports the results of some tests made with vaccines for swine plague and hog cholera. The vaccines are prepared by treating the highly virulent microorganisms or microorganism and filterable virus (hog cholera) with a metal (not a solution of metallic salts) which is specific for the microorganism in question. Most of the tests reported were conducted with mice, rabbits and guinea pigs. A certain amount of haziness surrounds the entire article.

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The fate of anthrax bacilli in barn refuse, by G. Roth. (Centralbl. f. Bakl. [Orig.], 1912, Vol. 63, No. 4/6, pp. 372–382.)—The urine and drippings from the feces were found to contain substances which were highly bactericidal towards the anthrax bacillus but not towards the spores of this organism.

Certain suggestions are presented in regard to utilizing this principle for destroying these organisms before the spore stage sets in.

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Sudden deaths in bovines due to the rupture of the spleen, by P. Knuth. (Centlb. f. Balkt. [Ref.], Vol. 52, No. 20, p. 612–613.)—In various districts of the province Schleswig-Holstein, during the last ten years, and in the months of May and June, numerous sudden deaths of bovine have occurred which were apparently due to internal hemorrhages or spleenic rupture. The characteristic symptoms present were the rapid onset of the condition and falling (paralysis-like) to the ground. As the cause either anthrax or symptomatic anthrax was suspected. On autopsy, however, the capsule of the spleen appeared to have small tears or rents on it and a large amount of blood was present in the abdominal cavity. In the blood as well as in the peripheral blood piroplasms of a large size were noted: in the organs smaller piroplasms were noted. Aside from these findings small points which simulated the Howell-Schmauch bodies were noted with Giemsa stain in the red blood corpuscles, the Marginal point of Theiler, the piroplasms marginale (Siebee), or the cocci like bodies noted by Smith and Kilbourne. The deaths were probably due to a periacute form of piroplasmosis.

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The disinfection of animal hair, as a precautionary measure against industrial anthrax, by K. Laubenheimer. (Zeitschr. f. Hyg. u. Infektionskh., 1912, Vol. 70, No. 3, pp. 321–332.)—As a result of handling hair from animals there occurs yearly numerous cases of anthrax in man, particularly in brush makers. The infectious material is sometimes transferred to foreign countries by this means. Five cases are reported in this article, two of which were fatal.

Despite the fact that crude hair, especially where the hair (balled) has not been loosened up, is subjected to steam disinfection as a precautionary measure, the anthrax organisms can often be detected in the same.

The author recommends that individuals engaged in gathering or working up hair provide themselves with a disinfector's outfit (hat, coat, trousers, shoes and mouth-

and-nose guard [Kobraks respirator]), which shall be disinfected after each use. In addition the worker is to thoroughly wash his hands and arms with a five-percent cresol-soap solution (creolin, etc.).

The floors should be washed and treated thoroughly with some effective disinfectant.

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NEOSALVARSAN. Rips. (Berl. Tierärtzl. Wochenschr., 1912. Vol. 28, No. 23, pp. 405.)—These are the results of comparative tests between Salvarsan (Ehrlichs 606 or dioxydiamidoarsenobenzol) and Neosalvarsan (Ehrlich's 914) for the pectoral form of equine influenza. It has a decided advantage over the former preparation in so far that it dissolves readily in water and neutralization with alkali is unnecessary. One and five-tenths Gms. of the preparation is equivalent to one Gram of the old preparation. For intravenous injection the substance is dissolved in a 0.3 percent solution of sodium chlorid. Neosalvarsan yielded the same clinical results as salvarsan. In all cases, twenty-four hours after injection polyuria set in.

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THE relative value of the catalase and reductase tests for milk. H. Bertin-Sans and E. Gaujoux. (Hyg. Viande et Lait, 1912, Vol. 6, No. 2, pp. 65–71.)—The results obtained with the catalase and reductase tests with watered milks are not relatively equal. The catalase test is to be given the preference.

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THE cause of foot-and-mouth disease and a vaccine for its treatment. (Berl. Tierärztlich., Wochenschr. 1912, Vol. 28, No. 26, p. 483.)—In the daily press it has been announced at various times that Preparator Grugel of the Hygienic Institute of the University at Rostock had discovered the cause of foot-and-mouth disease, and in addition had prepared a vaccine against this pest. Inquiries made at the institution proved that there were no grounds for this belief.

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RICKETS in young pigs. By A. V. Toth. (Allatorvosi Lapok., 1912, Vol. 35, No. 24, pp. 279–281.)—This disease which produces a great mortality amongst young pigs can be very easily confused with other epizootical diseases.

The disease is ushered in in many instances with nervous symptoms, i. e., clonic convulsions which are often present in erysipelas, pyemic cachexia, and hog cholera.

In the author's practice rickets caused the death of 508 out of 916 animals in one herd. The cause for this lies in the feeding of feeds containing too low a percent of calcium salts.

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CHOREA in a horse. District Veterinarian Kubaschewski. (Veroffentlichungen aus dem Jahres-Veterinar—Berichten der Beamteten Tierarzte Preussens, 1909, II, Teil, p. 45, Berlin, 1912.)—Peculiar rythmic sideward movements of the head and opening and shutting of the jaws were noted in a horse. The temperature was normal and the pulse and respiratory rate were somewhat reduced. The symptoms after a time began to let up, but when food was given or the animal was exercised they recurred.

After six days, as a result of giving bromides, the animal recovered.

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THE complement fixation reaction in tuberculosis. Hammer (Heidelberg).—(Centralbl. f. Bakt. I, Abteil. Beilheft. Vol. 54, Ref. p. 201.)—With Wassermann and Brucks' complement fixation reaction antibodies can be detected in the serum of tuberculous subjects. Out of forty-six cases of tuberculosis in man positive results were obtained with forty-three. With tuberculous bovines twenty out of twenty-six responded to the test.

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EXPERIMENTAL studies in regard to kakke (beriberi). K. Shiga. (Centbl. Bakt. [etc.], 1. Abt., Ref., 1912, 54 Beilheft, pp. 156–170, Fig. 1.)—The substance in rice bran which prevents beriberi is soluble in warm alcohol. Tests with fowls, etc., injected with this alcoholic extract demonstrated that the paralysis present in this disease is in no direct relation with the state of nutrition in which the animal is in. Beriberi in man is not similar to that observed in birds because a general atrophy is present before the paralysis occurs in

the latter. Pigeons are particularly disposed to this paralysis, but they do not take the disease if polished rice and barley are fed together in equal amounts.

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A RAPID gravimetric method of standardizing vaccines. James W. Wilson and Charles Dickson. (J. Hygiene, 1912, Vol. 12, 49–59.)—Bacterial emulsions are rapidly evaporated to dryness in tared flasks or on tared platinum foil, and the strength of the emulsion determined by the increase in weight of the flasks or foil. The method is more rapid, less fatiguing, and more trustworthy than counting methods.

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OCCURRENCE of Filaria papillosa in Mongolian horses. Helmuth. (Zeitschr. f. Veterinarkde., 1912, Vol. 24, No. 3, pp. 129–131.)—Filaria papillosa were observed in the eyes of Mongolian ponies and occur mostly during the rainy season, which is on during the months of June, July and August. The infested eyes are usually destroyed by these parasites.

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STUDIES in regard to contagious abortion. J. Pekar. (Berl. Tierärztl. Wochenschr., 1912, Vol. 28, Nos. 3–5,)—The common pasture is a greater factor in the distribution of this disease than the barn. Infection usually occurs *per os*. Colpitis folliculosa is not the cause of the disease. The process of abortion can be brought about by feeding portions of the hepatised lung and the intestinal contents from slinked calves, the uterine secretion, the yellow chorion exudate and the fetal membranes. The organism causing abortion resembles those producing septic enteritis, pneumonia, arthritis, and the general septicemia in calves.

Calves born sound can be infected *per os*. The incubation period is ten to nineteen days.

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THE action of certain products obtained from the tubercle bacillus. B. White and O. T. Avery. (Jour. Med. Research, 1912, Vol. 26, No. 2, pp. 317–356.)—(1) Tuberculoprotein treated by the method of Vaughan yields a poisonous substance (called toxophore by Vaughan), which, in suitable doses, produces in normal guinea pigs an intoxication resembling, if not identical with, the specific immediate protein intoxication in hypersensitive guinea pigs.

The gross pathological findings appear to be similar in both conditions. The minimum fatal dose of two preparations was 1 part to 15,000 parts of body weight. (2) Boiling for one minute with filtration does not affect the potency of the watery solution. (3) Fatal doses of the poison cause an abrupt fall in temperature. Smaller amounts (up to 0.01 Gm. for pigs of from 200 to 250 Gm. weight) are apparently without appreciable effect on the body temperature. (4) Under the experimental conditions noted, repeated increasing doses of poison fail to render animals immune to a minimum fatal dose. (5) Survival from a large intravenous dose of the poison apparently renders the animal refractory, for forty-eight hours at least, to an amount in excess of that required to kill. (6) Fresh brain, lung, and liver tissue, under the conditions noted, showed no binding or neutralizing affinity for the poison. (7) Normal guinea pig serum has little if any destructive action on the cell poison. (8) Intradermic injections of 0.00005 Gm. of the poison produced no local reactions in normal or sensitized pigs. (9) Atropine sulphate protected seventy-five percent of the animals from a synchronous injection of fatal amounts of poison. (10) Morphine sulphate aborts the acute symptoms and delays death, and in two cases completely protected from fatal intoxication. (11) Chloral protected many of the animals against an otherwise fatal dose of the poison, and inhibited the acute manifestations and delayed death in others. (12) Lecithin emulsion injected simultaneously with the poison seems to possess a slight and irregular prophylactic action. Incubation of the poison with lecithin emulsion for one hour at 37.5° C. increases this neutralizing property. A dose of 1 to 12,000 of the poison was not affected. The preliminary administration of lecithin protected some of the animals, delayed death in others, and was without effect in the remainder. The results were too inconstant to warrant definite conclusions.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

The "Horse Plague" in Kansas

THE clinical signs are about the same that you will find in all cases of "blind staggers," except that the great majority of cases show no signs of excitement, but on the contrary are very sleepy; they stand around with the head hanging; the ears drooping; the eyes about half closed; the front feet apart, propping themselves; some move in a circle when traveling, holding the head to the side; some circle one way and others the other; some will circle either way, some walk in a straight line when traveling; the temperature usually reaches 105° or 106° F.; the pulse is weak and ribbon-like and beats about sixty to seventy per minute. Respirations about forty-five to fifty per minute; there is a great variation in the length of time that they stay up; some will show the first symptoms only a few hours before they go down, and die in a very short time; while others will stay up several days and then finally go down. I notice that among the cases that go down early there are scarcely any that recover; while among those that stay on their feet for several days there is a small percentage of recoveries; there are more cases recovering now since people have quit using every remedy that they could hear of.

So far I feel safe in saying that no one remedy has cured one percent of the cases it has been used on. I had best results from the administration of a purgative of aloin, six drams, calomel, forty grains, santonin, forty grains, and nux vomica, one dram, if I could get to them before they showed plain symptoms of paralysis of the throat. I followed this up with a half-ounce of bismuth subnitrate twice daily in a capsule, but I must say that I do not advise it as a treatment. I tried it along with other lines that I tried while experimenting and like it the best of any. In most cases I also used hypodermic injections of strychnine and atropine half-grain doses alternately twice daily; this seems to relieve the paralysis to some extent.

As a preventative there is but one in which I have any faith; this is vaccination; I am well aware of the fact that some good men are condemning vaccination for this malady very bitterly; but I certainly think that they have not given it a proper trial, or an unprejudiced investigation.

I went to Ellis County, Kansas, where the disease was at its worst, Ellis County having lost 3000 head out of about 12,000 horses owned in the county; I held my first autopsy in the county August 15th, and concluded immediately that I was up against a new one; I at once sent cerebrospinal fluid, blood, lymph glands, portions of the bowel, liver, heart, kidneys, spleen, stomach, brain and spinal cord to Dr. Roy Cross, chemist in Kansas City, for laboratory investigation. He wired back in a day or so that he had isolated the diplococcus that causes cerebrospinal meningitis in man, with slight modifica-

tions, and he asked for more material. I sent him this and he again succeeded in isolating the diplococcus. In all I sent him material from fourteen different animals of all ages, sizes, colors and in different stages of the disease and in each he found the diplococcus. I killed each of the animals by bleeding from the carotid artery.

We made arrangements with Doctor Cross to prepare a vaccine for us if it was at all possible; this he did. We gave 7 1-2 Cc. of this vaccine at a dose and gave three doses about five days apart. As a reaction we got a raise in temperature of an average of three degrees Fahrenheit, a swelling at point of injection (the side of the neck), about the size of my hand, which lasted from four to six days, and in some cases considerable stiffness, so much that some farmers would call me and tell me that that stuff foundered some of their horses. The stiffness did not last longer than about three days. On second dose the symptoms would be about the same as in the first except that the stiffness was generally increased. On third dose none of the signs was as well marked as in the other two doses and on several occasions I gave the fourth dose with absolutely no reaction. I also gave this vaccine to horses that had been sick and recovered with absolutely no reaction. This made me feel that a horse that had been sick and recovered and one that received two doses were about alike in their susceptibility to the disease.

So far I have not found a case where the horse has become infected the second time; nor a case where a vaccinated horse became sick after the second vaccination, and know of only a very few that were affected after the first vaccination. It is now over a month since I began vaccinating, and there are no adverse reports. I did not select the herds that I vaccinated, but took them as I came to them; in several instances I went into a herd of fifty or more where there had been more than a dozen deaths, with three or four sick ones at the time and not another case would occur in that herd.

There are now about 1500 to 1600 vaccinated horses in Ellis County with three deaths among vaccinated ones and each of these died within four days after the first vaccination. During the last two weeks I have vaccinated 560 head of horses with the vaccine made by the Veterinary Department of the State Agricultural College, with equally good results; as far as I can tell clinically I can note but very little difference in the reaction from the use of the two vaccines named.

As to the cause and mode of transmission of this disease I have nothing of value to offer. I have listened to the arguments of our recognized chemists, bacteriologist, pathologists and professors and do not think that they have arrived at final conclusion, nor do I believe they have as yet solved this part of the question. Some blame the feed, some the water and some both, and some neither; and with this last class I am a little inclined to train.

I have found this disease under so many different conditions as to feed and water that I can scarcely believe that either one of them is to blame. I have investigated this part of the trouble in six different counties and do not see how the feed or water can be to blame; one place that I visited the farmer had but one source of water, and this was from three different springs, each one was controlled by pipes running out through a small dam made of large rock leading into a small iron tub; and the water entering at the bottom of the tub and the water running out over the top of the tub; thus not allowing any water to remain therein and become stagnant; three horses that he lost were colts running out upon a high grass pasture; four others were work horses that had not been out on any kind of pasture this whole summer. Surely the water could not be to blame in this case and the water was the only thing that the seven head of horses were receiving in common. I have seen stallions die that had not been out on pasture a minute since they come from France several years ago; had received no water except from a bucket, and freshly drawn from a good deep driven well; fed nothing but good clean well-cured alfalfa and oats. I could go on and mention many such cases but think it useless.

On each and every autopsy I found the "palisade worm" there, I believe by the millions, in the bowels, blood, and brain,

now why could they not in some way be responsible for some of this trouble? I found them just about as numerous in a three months' old colt as in horses ranging from three years to twenty-four years. Why should they be there in such great numbers in a young suckling colt?

Of course the vaccination business is yet in the experimental stage and we cannot make any positive statement as to its establishing a permanent immunity. But I do not hesitate to state in face of the argument of certain investigators, that *vaccination certainly establishes a temporary immunity;* this immunity is now over a month old among horses in one of the worst infected districts in the state. I cordially invite any one wishing to do so, to come to Ellis County while I am still here, and I expect to remain here two weeks yet, and make a thorough investigation of the horses that have been vaccinated by either the Cross vaccine or that made by the State. I spent two days at Hoxie, Kansas, investigating the work done by those making the state vaccine and I found they are having equally as good results there, as I have had here.

One investigator was quoted as saying that all vaccination was worse then folly; this man surely did not take the trouble to go where the vaccination was being done properly; neither did he state what vaccine had been used where he made his investigation. Maybe it was where some quack was using blackleg vaccine. Plenty of it was used.

I unhesitatingly advise every veterinarian in infected localities to urge his clients to have their well horses vaccinated, if the disease is in any way threatening. There has been a good many cases where horses that had been sick and apparently gotten well, would suddenly drop dead. On postmortem examination it was plainly seen to be a case of death from embolism, caused by the palisade worm.

Salina, Kan. H. S. MAXWELL.

TURPENTINE WITH CHLOROFORM FOR "SWEENY"

In current veterinary journals, I have observed much adverse criticism of the practice of using turpentine in the treatment of atrophy (sweeny), on account of the intense irritation and consequent great suffering which it produces in the equine.

None of the writers express doubt as to its efficacy, their sole objection being from a humanitarian standpoint, and the objection which the owner would have upon observing its effects. Dr. C. L. Wilhite, Manilla, Iowa, refers to this objection in his valuable article, "Previous Urachus," printed in the December, 1911, issue of VETERINARY MEDICINE.

In my practice I have adopted a method which entirely obviates this objectionable feature and permits me to use this valuable remedy with impunity. It consists simply in the addition of from two to four drams of chloroform to the ounce of turpentine.

This completely prevents the irritation and pain without depreciating the desired results.

The turpentine-and-chloroform mixture is to be administered in exactly the same manner as though turpentine alone were used, being sure to agitate the mixture so as to thoroughly blend the two before using.

E. H. KING, D. V. S.

Lake View, Mich.

EDEMATOUS SEPTICEMIA, OR WAS IT PYEMIA?

On July the 18th I was called to see a yearling colt, which the owner stated had an enlargement in the left flank, and found the following:

There was an edematous swelling about the size of a small plate over the last four or five ribs and about ten inches from the center of the back. This had broken in the center, where there was a pocket of about the size of half an egg.

I enlarged the opening and also opened about eight or ten other small abscesses varying in size from that of a small hickory nut to half an egg. These were full of pus and upon pressure they would evacuate gas. The pus was yellowish, thin and slightly streaked with blood.

There were also a number of tumors or doughy enlargements that were not ready to open. But the following day they were soft and full of pus. I never saw anything

run pus like these abscesses did. Every day there would be new abscesses to open, some as large as a small fist (flat like).

Later on there was one that formed at the shoulder as large as a man's head. Now this continued to spread until it covered the entire side, also the hip and shoulder and belly. The owner said that he thought it had nearly decayed through into the abdominal cavity. There seemed to be a progressive inflammation of the connective tissue around the borders and very sensitive at this time. I presume there were as many as one hundred abscesses running pus at one time, so you can imagine the amount of pus evacuated every day. It certainly was a rotten mess and an awful job to try and keep it clean, although the owner worked very faithfully and kept it as clean as possible. The abscesses were not as a rule deep seated but were merely under the skin.

It seemed impossible to check the migration of this germ (Vibrio septicus, I should call it) and its dirty work killed the colt after about five weeks' suffering. Although it had a pretty good appetite and drank lots of water to the last, it became much emaciated and very weak and finally it could not get up alone.

Treatment.—This was very unsatisfactory. Internally I gave from the beginning potassium iodide, one dram per day for about twelve days. Also gave one ampule bacterins every four days. Getting no results after about two weeks I gave tincture of iron chloride in dram doses, night and morning, and about five to seven grains of bichromate potassium each noon and at bedtime. This I kept up to the last with no better results than were received from the potassium iodide. The germs seemed to grow fat under treatment and expel more pus from abscesses than ever. Anyone wanting pus could have secured a quart or a gallon any time for it was nearly running in a stream.

Locally I used nearly everything. At first I washed the abscesses well with a strong solution of creolin, then with carbolic acid and applied all around the affected parts an iodine liniment made as follows:

Iodine crystals	4 drams
Camphor gum	1 ounce
Turpentine	2 ounces
Alcohol, q. s.	1 pint

This liniment, however, had no effect in keeping the abscesses from spreading.

After a few days I had the owner use a bichloride of mercury solution, in warm water 1 to 200 and inject into all abscesses twice a day and at noon we injected tincture of iodine into the abscesses.

After a few weeks' treatment I began using magnesium sulphate solution as strong as possible, which was injected into the abscesses and heavy cloths saturated with it and laid over the colt's side, but nothing would check the flow of pus.

Had this colt died in a day or two I would have called it malignant edema, for the symptoms are almost exactly the same. Now I should be pleased to have some of the readers give me a line of treatment more satisfactory than the one I used. Also some reports of similar cases.

C. J. HECKARD, D. V. M.
Wheatland, Iowa.

A RECOVERY FROM MALIGNANT EDEMA

This case came into the hospital a few years ago, with a swelling starting about the middle of the cervial vertebra reaching back to the dorsal vertebra. It was fully a foot wide and extended all the way back to a collar sore on the neck from which there was a fetid odor.

The temperature was 106° F., pulse imperceptible. I told the owner his horse had an infection and it had gone so far that he might as well take her home and destroy her. But it was a valuable animal, and he wanted an effort made to save her, so he left her with me.

I made several large incisions into the swelling and from each observed the same odor that I had noticed before. A great deal of the tissue was dead and sloughing.

I gave her internal treatment of stimulants, whiskey, quinine, nux and iron. I irrigated the opening thoroughly with warm water, using iodine and camphophenique. The next morning I could smell that animal before I got into the barn, and I asked the owner to take her away because I did not like to have her around. He

came down in about an hour to lead her out. He took a supply of medicine with him because he was not going to give her up. She had a temperature at that time of 106° F. Two days later he called me up and asked me to come and see her. I found the skin all dead about a foot away from the original sore all around and the line of demarkation between the dead and healthy tissue could be well seen. I took my knife and separated it and it all came away, about twenty-five or thirty pounds of it, and it left a deep cavity.

In spite of my prognosis the animal made a complete recovery. Part of the bone came away. She has a cavity there today that you could put a bucket into but she is still a good work and brood mare.

C. G. GLENDENNING.

Clinton, Ill.

RUPTURE (OR PARALYSIS) OF THE FLEXOR METATARSI MUSCLE

I was called to a livery barn to see a four-year-old pacing mare and found her standing at perfect ease in her stall. The history of the case is as follows:

This mare had been driven about forty miles the preceding day and had been found cast in her stall this morning.

I examined her in the stall and could find nothing but several skin bruises, which you note in the picture. The owner then took her from the stall and to my surprise I found she was unable to carry her right hind limb forward and upward. The picture shows the rest.

After taking the picture she was returned to her stall. Diagnosis: Rupture of the flexor metatarsi muscle.

Treatment: Absolute rest, light diet. The limb was washed in a warm solution of 1-1000 bichloride of mercury and then dried. Adhesive tape was then applied very tightly and on top of the tape steel splints were applied. The splints being made in such a manner that they held the limb in a flexed condition.

On the eighteenth day the splints were removed and two more weeks rest allowed. Recovery complete.

O. J. JOHNSON, D. V. M.

Stewartville, Minn.

SOME NOTES ON SHOULDER ATROPHY

In reply to the query in September number of VETERINARY MEDICINE concerning the use of turpentine hypodermically in shoulder atrophy. The inquirer will have better success by not using it.

In my first cases of atrophy which were treated by the hypodermic method I used oleum terebinthina injections of from five to ten minims about two inches apart. Well, we got results quick. In fifteen minutes the hind feet began to go upwards, and the animal to climb mangers and walls till the irritation would subside. The edematous condition lasts generally a week and nearly all cases result in small abscesses at the point of injection, even where the shoulder and the needle are as aseptic as it is possible to get them.

Next I tried a mixture of alcohol and turpentine, with better results.

For the last three years I have used alcohol alone, and use from 2 Cc. to 5 Cc. at every point of insertion. Sometimes using more. Where the skin is thickened or indurated I then apply a mild blister over the affected part.

The edematous condition lasts from five days to two weeks. I have had cases that went three weeks before showing a hollow space. It is very seldom that more than two treatments are needed, except in cases where some blistering or roweling has been done, or where a dime has been buried underneath the skin and caused an induration of skin and panniculus carnosus muscle, in which cases several injections will be needed. I have had two small abscesses from the latter treatment due to some impurity in the alcohol. I have treated several cases where another practitioner had used turpentine with some mixture. One case the shoulder sloughed away due to large quantities of irritant and possibly some neglect of the case.

H. M. HALVERSON, M. D. C.

Yankton, S. D.

FORMULA FOR "SLIM JIM"

In the October number of your journal F. G. D. wants to know the formula for "Slim Jim Liniment." It is as follows:

Alcohol.....1 quart
Oil sassafras,
Tincture aconite, aa.....1 ounce
Oil hemlock, oil cedar, oil organum, spirits camphor, tincture capsicum, tincture myrrh, turpentine, chloroform, aa.....4 drams

J. E. FOSTER.

Coshocton, O.

—

Dr. J. H. Lenfestey, Lyons, Ohio, sends the same formula, as does also Dr. N. Rectenwald of Pittsburgh, Pa.

Dr. W. G. Clark, Marinette, Wis., sends in the following for "Slim Jim" which differs slightly from the others:

"In the October issue just received I note the inquiry of F. G., Colorado, for the formula of "Slim Jim" leg and body wash extensively used by trainers.

The following is the formula:

Oil of sassafras, tincture of myrrh, oil of cedar, oil of hemlock, aa..... 1 ounce
Oil of origanum..... 2 ounces
Camphor gum..... 4 drams
Tincture aconite.....20 minims
Chloroform..... 4 drams
Sulphuric ether, tincture opium, aa..... 4 drams
Spirite of nitrous ether, tincture of arnica, aa.... 1 ounce
Spirits vini recti..... 8 ounces

M. Dissolve the camphor in alcohol and then add the oils and the remainder of the prescription.

"Sig. For leg and body wash usually use one tablespoonful to one quart of water.

This is strongly on the order of the old "shot gun" mixtures but is held in high repute among trainers and track men in general."

ARECOLINE CAUSE DRENCHING PNEUMONIA

I am going to write of my experience with arecoline in choke. I have used arecoline in choke for several years with good results, but lately I had a patient develop a case of pneumonia after the choke was gone, and I have heard of two other cases doing the same. My theory is that the esophagus being filled with saliva and the horse, coughing, gagging and expelling the saliva from nostrils, gets some of it into its trachea and causes pneumonia. I would like to hear if any one else has seen such cases.

CHAS. M. LUNN, M. D. V.

Malta, Ill.

ON THE VERY DECIDED ACTION OF ANTIPERIOSTIN*

By DR. VALENTIN SCHAFFNER
Veterinary in the Imperial and Royal Austrian Army.

For the last six years I have employed antiperiostin in many cases of exostoses, ringbone, spavin, inflammations of tendons and tendon sheaths, making simultaneous tests with unguent hydrargyr. biniodidi 1:4 and also with *fibrolysis*, and have found the following surprising results: in exostosis, ringbone, spavin and tendinitis, antiperiostin is of equal value with other irritants but it has the advantage that in most cases the animals may be used for service after three days.

When all other methods had failed I obtained the best of results in inflammations of tenden sheaths and in sores of the coronal tendons and of the flexor tendons of the os pedis, in the pastern and above the pastern joint, in the tendon sheath of the common flexor tendons on the anterior aspect of the fetlock, in very large and expanded tendon sheaths of the carpal joint and in sores on the flexor tendons of the hock which may become as large as a man's fist.

Treatment.—The antiperiostin is well shaken and poured on a pad of absorbant cotton with which the place to be treated is well moistened and carefully and gently rubbed for several minutes. The hair must be trimmed previously. This is necessary to prevent an excessive amount of the remedy being retained by the hairs, because this might lead to loss of the hair, to persistent scars, and to persistent hairless spots.

After many experiments I found that in sore tendon sheaths, and in tendovaginitis in which all other remedies had failed a single careful application of antiperiostin

*Translated from Wochen. für Tierheilk., by Dr. H. J. Achard, Chicago.

secured complete healing. The objections which many veterinarians maintain against the administration of antiperiostin are entirely unjustified, and the important point is how and when the remedy is employed.

THORACIC CHOKE IN A STEER

I was called to see a 1500-pound steer, and found him badly bloated and in very much distress. He had broke into an apple orchard that morning and I suspected choke, but could not locate it by manipulation, although all fluid given by the mouth was regurgitated. I tapped him with a trocar, and gave him two grains of arecoline hydrobromide hypodermically, then elevated his head and gave him one dram of fluid extract of belladonna and seven drams of glycerine in capsule. I waited thirty minutes and gave him another capsule of belladonna and glycerine.

Results: Complete recovery.

THE POSTMORTEM DIAGNOSIS OF HOG CHOLERA

As a possible answer to a question in the July issue, I will give my method of diagnosing hog cholera in the field.

If hog cholera is suspected I hold a postmortem examination on an animal that has died from the disease or I kill one for this purpose that is nearing the end. On opening the animal I note the general condition of the abdominal cavity and the bowels.

In hog cholera I expect to find a yellowish exudate in the abdominal cavity. In the bowels, especially the small intestine, I expect to find more or less enteritis; the mucous membranes showing various stages of congestion. The presence of ulcers in the small intestines is quite important and diagnostic. But it is on the following that I clinch my diagnosis. I learned this while in meat inspection service at the Chicago abattoirs where I saw a large number of cholera hogs, and the following conditions occurred in every case:

On the capsule of the kidneys petechiæ are found invariably. The lymph glands were of a dark red color. After noting the above, I split vertebræ and if hog cholera is present the marrow of the bone or rather the spongy portion of the bone will be of a dark-red color something near the color of venous blood. The last mentioned symptoms never fail to occur.

The examination described above requires only a very few minutes and I deem it almost as accurate as a laboratory diagnosis (animal inoculation) which the average practitioner is either too busy or not equipped to carry out.

CLARENCE E. COOK, D. V. M.

Ada, O.

UNEXPECTED FATALITY FROM TETANUS

I had a case of tetanus about ten or twelve years ago. The patient was up and was being led up and down the alley and was just about ready to be put to harness. All symptoms of tetanus had abated. He was a little bay gelding weighing about a thousand pounds.

I was called in a hurry on the morning of the Fourth of July. I found him in the acute stages of tetanus. He died in about two hours. The original infection had run along about two weeks, and when he was just about ready to be put to the harness. The boys had been shooting off firecrackers and toy cannons in the alley and I laid it to the excitement from the shooting.

I had a similar case the following Fourth, and that made me even more sure than ever that this was the cause.

A. C. WORMS, M. D. C.

Chicago, Ill.

DISCUSSION

W. H. WELCH: I had an animal that died in the same way, and there was no Fourth of July complication either. She was in the sling three weeks. On the thirtieth day from the time she first exhibited symptoms of tetanus she was out of the sling and was being led back and forth to water and was practically cured. On the thirty-second day she had an acute attack of tetanus and died the following morning.

She was not excited at any time. I have mentioned this case to several. There was a new abrasion of the skin from the sling harness and it occurred to me that here was a case where there was no immunity produced during the process of the disease, because there was certainly a reinfection.

A. H. BAKER: I imagine from Doctor Worms's remarks that he has arrived at the same conclusion that we have as to the usual length of time required for a case of tetanus to recover. It is considered that seventy-five per cent of the cases that live eighteen days recover, and about ninety per cent of those living twenty-one days recover, and yet we sometimes meet with a fatality from tetanus on the thirtieth or the thirty-second day.

It has always been a mystery to me to account for these sudden deaths where you have every reason to expect recovery.

This case that Doctor Welch just related is similar to one of my own except that he had an abrasion from the sling harness and mine did not. I had a case that on the twenty-second day took a relapse and on the twenty-eighth day died. I could not account for it. On the other hand, I do believe that wounds produced by the harness become infected, constitute a new focus of infection and generate more toxin with the resultant fatal termination from it, in spite of the recovery from the primary infection.

Of course this is unnatural, but the longer you handle animals the more impossible it becomes for you to ascribe reasons for everything that occurs in practice.

CASE OF BILATERAL TUBAL PREGNANCY WITH RUPTURE ON EITHER SIDE

An interesting report of a case of this kind, read before the South Australian Branch of the British Medical Association and published in the Australasian Medical Gazette by T. G. Wilson, M. D., F. R. C. S., is illustrated by three photographs taken by Veterinary Surgeon Desmond of Adelaide, South Australia.

The May issue of VETERINARY MEDICINE is O.K.

L. E. BECKHAM.

Moundville, Ala.

WHAT AILED THESE DOGS?

In my practice I have come across quite a number of cases of which the diagnosis, as far as I have been able to make, has not been satisfactory to myself, although some have responded to the treatment which I have given, and others have not.

There is one condition which occurred as paresis, in a kennel of greyhounds, of which I would like to mention in particular and would like some help in making a diagnosis if possible. Maybe some one who is interested more particularly in canine practice will help me out. Here is a description of symptoms as far as I was able to note:

On the 19th day of August I was called out to see the hounds and given the following history: Previous to the 13th of August the dogs had been kept in a kennel for seventeen days on a diet of bread and milk. On this night they were taken out for a run and were probably out three hours, but the owner says they were not worked very hard.

After being brought back, a large turkey which had been killed by a guinea hen, was fed to the dogs. This turkey had had access to an orchard which had been sprayed with lead arsenate.

The condition as I found it was as follows: In the kennel were two old bitches, about four years, both heavy with pups, and two pups about eight months old, one bitch and one dog. The pups both being from one of the bitches, which I will call Bitch No. 1. Bitch No. 2, the other old bitch, not being affected, had been isolated at the first appearance of the attack and never did show any symptoms. The eight-months' old bitch pup, the next morning after being worked and eating the turkey, was found to be unable to use her hind parts. The morning after this, Bitch No. 1 became paralyzed in both fore and hind limbs and was unable to rise even to a sitting position. And the morning after this the dog pup was found to be very stiff, walking, as the owner said, with a "piggy gait," back arched, head down and all muscles set and hard.

There was no movement from the bowels at any time while this condition lasted,

except what was removed by enemas. When I arrived on the 19th I found the condition, as described above, also that their temperature and rate of heart beat were about normal. Respiration being a little labored. The belly was tucked up, but I was able to remove by enema quite an amount of semi-hard feces.

I put the two that were down on Triple Arsenates with Nuclein Compound (Abbott), also left word to alternate doses of linseed oil, castor and cascara. These Triple Arsenate pills contained 1-128 grain of strychnine arsenate and were given three times a day, which, according to the owner, was carried out. On the 22d of August the muscles of the dog pup seemed to relax and he walked normal, and then for the first time had a free passage from the bowels, and since that time has been normal. On the 27th the bitch pup was able to get up and walk and had free movement of the bowels, and on the 29th the old bitch was able to get up and walk and also had her first unaided passage. All the animals retained their appetite and apparently felt all right all the time, but were kept on a scanty diet. I have seen them once since and all are apparently as healthy as ever. Just four days after they got around a brother to the owner, two miles distant, who is also a dog fancier, had an old greyhound, come down the same way, and was advised to use the same treatment, and I have not heard since with what results.

If any reader can help me out in a diagnosis it will be very much appreciated.

E. P. Coburn, D. V. M.

Brigham City, Utah.

GASTROPHILUS LARVÆ IN TOOTH CAVITIES*

The report of this case is probably of no material value but was interesting to me because I had never heard of anything of the kind before.

The patient was a horse with an unilateral nasal discharge. The teeth appeared perfect upon first examination, but failing to find any other cause for the discharge I went back to the mouth and just outside of the fourth molar discovered a small canal running up beside the tooth, which was extracted after some perspiring, because the tooth itself was very solid.

I accidentally discovered in the course of the canal and clinging to the side of the tooth a small, hard, dirty white worm about three-eighths of an inch in length, about the diameter of broom wire, and pointed at each end. There was evidence of considerable work on the part of the parasite, the outer surface of the tooth presented much the same appearance as does a log that is worm eaten, just under the bark, but of course not so deeply penetrated.

Since then I have found several teeth much the same in appearance, and I am satisfied were from the same cause, but I have never been fortunate enough to locate the parasite, which of course is not surprising on account of the manipulation in extracting the tooth and the obscurity of the place.

H. B. Treman.

Rockwell City, Ia.

*Read at meeting, Missouri Valley Veterinary Association, Omaha, July 1, 2 and 3, 1912.

A TREATMENT FOR BOG SPAVIN

In the May journal, page 204, J. F. Lavery asks for a treatment for bog spavin and I will give you one I have pursued for years and have had grand success.

First insert an hypodermic trocar and canula into the softest part of the swelling and squeeze out all of the fluid and then bathe joint well with cold water. Repeat this treatment three or four times at intervals of three or four days apart then apply the following blister.

1. Tincture Iodine.....1 ounce
2. Corrosive Sublimate..½ ounce
3. Potassium Iodide.....1½ ounce
4. Cantharides.....½ ounce
5. Copper Sulphate.....2 drams
5. Prussian Blue.....2 drams
7. Arsenic.....2 drams
8. Lard.....1 pound

Mix one and three first, then add the others. Apply a good blister and grease in six or seven days lightly, and after two or three days grease a little more. Repeat this blister in thirty days if necessary.

You are certainly publishing the best veterinary journal in the world. One copy was worth one hundred dollars to me, for in it I found a remedy that has made me more than that amount (Glyco Heroin). The May number is a dandy. Keep her up for the profession wants it and must have just such literature as this—always progressive.

C. E. HATCH, V. S.

Gainsville, N. Y.

SEQUELÆ OF ROUP

From the Laboratory of Pathology, Colorado Agricultural College, Division Veterinary Medicine

There have been several hens brought to this laboratory during the past summer with enlargements in front and below the eye. Some of these were of several months' standing.

Occasionally the enlargement takes on a stage of acute inflammation and the whole side of the face including the eye becomes swollen and red. Later this inflammation subsides.

These cases invariably follow roup. The virus of roup affects particularly mucous membranes. The mucous membrane of the superior maxillary (suborbital) sinus is usually involved in nasal roup. The products, a cheesy, pus-like material, finding no outlet, remains.

The outer wall of this sinus is thin and can be readily lanced, and the cheesy mass removed by aid of the point of a knife. Usually the entire quantity can be removed in a ball-like mass.

B. F. KAUPP, *Pathologist.*

AN ELASTIC STOCKING FOR ENLARGED FETLOCKS

Reply to inquiry for treatment of enlarged pastern and fetlock, by J. M., D. V. S., Illinois, August number of VETERINARY MEDICINE:

I have had considerable experience with these cases in twenty-five years of city practice, and am of the opinion that the trouble in this case is due to enlargement of the blood and lymphatic vessels, due either to an injury or a previous attack of lymphangitis. I saw a fine coach horse recently which I treated over three years ago for acute lymphangitis in the right hind leg and it remained large from the hock down, but the swelling would all go away while working but would swell up large after standing.

After all external treatments failed I sent to Sharp & Smith of Chicago and had them make me an elastic stocking, giving measurements according to instructions in their catalog and laced it on every time the horse came in from work or rather had the coachman do it and left it on until he went out again. It causes even pressure on the leg, giving the vessels a chance to contract.

This stocking was used until it was worn out, which was more than a year ago. No treatment has been given the leg since, yet it is as fine as the other one. It may be of some benefit to give the mare small doses of iodode of potash and Fowler's solution, gradually increasing the dose for a while and then gradually reducing it.

Putting on the elastic stocking is very little trouble, when the horse comes in from work, and I am satisfied it will accomplish more good than many times its cost in medicine used internally. Try it and report the outcome in VETERINARY MEDICINE.

H. S. RICHARDS, D. V. S.

Pittsburg, Pa.

CIRCUMCISION OF A BOAR*

A valuable Poland China boar, ten months old, was sold as a stock hog, but was unable to perform service, because of inability to get the penis outside of the sheath, which was large and very pendulent and pointed almost backward.

Upon examination I found the mucous membrane inside the sheath hanging in folds which caught the end of the penis and directed it up along the belly above the opening and accounted for the trouble.

With a tenaculum and my finger I drew out fold after fold of mucus membrane and cut them off with scissors. Then in the anterior angle which the sheath forms with the belly I took out an elliptical piece of

*Read at Annual Meeting, Missouri Valley Veterinary Association, Omaha, July 1, 2 and 3, 1912.

skin, about two inches in width, perpendicular to the linia alba, and stitched the edges together, thus drawing the anterior portion of the sheath nearer the belly and directing it forward.

The results were all that could be expected; the pig was again sold and proved a successful breeder.

H. B. TREMAN.

Rockwell City, Ia.

UNEXPECTED DEATH FROM MILK FEVER*

This death was probably not so much unexpected as it was unnecessary. It was a case of milk fever, where the animal was not very bad. I was called to see her at nine o'clock in the morning and she did not appear very sick. She was able to get up and stagger a few rods to the shade. I gave her the ordinary air treatment. At four o'clock in the afternoon she was out eating grass. At nine o'clock the farmer said she was in her usual health, and at nine o'clock the next morning I went out to see her and she was dead. The owner was so inconsistent as to ask me why she died! I will ask you.

I have had a number of such cases. In the cases where they have been down for some time and are bad I believe they die from apoplexy, from cerebral pressure, but this case had not been sick long enough to die from any such cause.

I have had cases of parturient paresis where there was mammitis present. Probably it is a Jersey cow, only good for milking purposes, and it is embarrassing to be obliged to have to deprive them of one or two quarters of the udder and then every time you come around have the farmer point her out to you.

It seems to me I have had more cases of milk fever, and that they have been worse, in the past year than ever before.

I have also had a good deal of trouble in obstetrics in mares, where they seemed to be in good condition, strong right up to the point of delivery, and then simply collapse and die—from shock, or something I do not know what.

I should like to ask you what is the trouble with these cases. Particularly in the mares which show no bruise or injury of any sort, in which no mechanical assistance was given and there is no reason whatever, so far as I can see, for it. They simply "cash in" about twenty minutes after they have foaled. I have used alcohol and strychnine and every other stimulant without any benefit whatsoever.

Last summer I had eight or ten of these cases. It is not so much the fact that they died that distressed me (for we all lose cases), but that I can see no reason, or no necessity, for their dying and even if I had known that it was to occur, I should have been powerless to prevent it. What would you do with such cases?

W. F. BROWNLEE.

Little York, Ill.

DISCUSSION

A. T. PETERS: In Europe they are using a treatment for milk fever that I have not heard of being used in this country. They are not at the present time using air, or at least they use it but sparingly. They are depending now upon the hypodermic use of adrenalin solution. When the air treatment was first presented everyone thought they were getting wonderful results from it, but the papers are lauding the adrenalin more now. If it is indicated anywhere it would be in parturient paresis where there are lesions that it would help to correct.

QUESTION: Would you expect to get beneficial results from arterial contraction in the brain or in the udder, or through the general system?

A. T. PETERS: So far as I remember the reports they really do not know, they have not yet determined the pathology. As many believe there are lesions in the brain from overfilled blood vessels as there are who assent to the theory of cerebral anemia as the cause of parturient paresis

It was Prof. Diberly of Hanover who first used adrenalin in the treatment of parturient paresis; he made a report about a year ago. I cannot give you all the technic but I know that it is given by

*Presented at a meeting of the Illinois Veterinary Medical Association, Springfield, July 10, 1912.

hypodermic injection of one or two Cc.'s, according to the size of the cow.

TREATMENT FOR HEAT PROSTRATION

"Does sunstroke differ from heat prostration in that the animal becomes unconscious?"

I have had many cases of the above and in one day treated eleven, all down and serious with but one loss to the ten recoveries. I do not believe the conditions should be differentiated where the malady has progressed till the animal is down.

My treatment, usually successful, is:

Give hypodermically one-fifth grain of nitroglycerine followed by digitalis or digitalin and aromatic spirits of ammonia, if procurable or alcohol or whisky orally.

If possible use water from a hose on head and neck, with object of *shock* of application, not a steady stream; if not obtainable apply cold-water packs or ice in bags to the occiput.

Of course, a shady place if possible and follow up the aromatic spirit. The animal should be on its feet in one to two hours but should not be moved, if possible, for two hours more.

F. G. L.

—— New York.

Dr. George B. Wells, who had recently purchased Dr. G. E. Corwin's practice at Canaan, Connecticut, died suddenly in the Winsted Hospital from a malignant case of septic infection. It is thought that he became infected while performing an operation on a cow.

Deceased was thirty-five years old and a native of Hancock, Massachusetts. Doctor Corwin has resumed his practice in Canaan.

RESUSCITATION OF A HORSE AFTER APPARENT DEATH*

Some time last summer I was called to see a gelding, probably eight years old. He had been fed lawn grass that had lain a few hours after cutting. When I got there they were very much excited and they had reason to be. He was exhibiting symptoms of gastric flatulence and staggering. He fell over and it seemed impossible to administer anything in the way of a drench.

I gave a quarter of a grain of atropine and succeeded in giving a couple of capsules of aromatic spirits of ammonia. The patient then seemed to be dead. The muscles were relaxed, the tongue hung out and the mouth, where it touched the ground, was covered with dirt; measurable respiration ceased. I pronounced him dead.

But in a few minutes I was able to feel a little respiration and from then the horse went on to complete recovery; an outcome that may not be unprecedented, but it was certainly unlooked for in this case.

H. A. PRESSLER.

Fairbury, Ill.

A DEATH PROBABLY DUE TO STOMACH RUPTURE*

Last spring I was called to see a three-year-old filly. She was shod and had been working. After the work got a little less pressing they turned her out part of the time. This morning she had been turned onto the road for grazing and exercise. An hour later she came running in in extreme pain. I was called.

I found the pain still acute, temperature 102.5° F., pulse (as nearly as I could get it) from seventy-two to seventy-five per minute. I could not get it accurately on account of the pain. She had all the symptoms of a developing inflammatory condition.

I gave her a full cathartic pill. I gave one tablet H-M-C, Formula A, and followed with another of the Formula B. I gave injections per rectum and put a hot, wet pack around the body.

After an hour the pain was considerably lessened and I left with instructions to keep up the hot packs and the injections if necessary, leaving some chloroform and some Cannabis Indica to be given by mouth whenever she needed it.

I fully expected this mare to recover, but in a short time they reported that

*Presented to Illinois Veterinary Medical Association, Springfield, July 9, 1912.

*Presented to Illinois Veterinary Medical Association, at Springfield, July 9, 1912.

she was dead. I did not have an opportunity to make a postmortem examination.

A. G. ALVERSON.

Bloomington, Ill.

A PECULIAR CASE OF RABIES IN AN EQUINE

Nowhere in literature have I seen described a decided case of dumb rabies in the horse. In most descriptions the symptoms of furious rabies seems to be given.

On July 6, 1912, I saw a gray Arabian mare, ten years old, which on the day previous had been bitten on the left nostril, near the alae, by a supposedly rabid dog. The owner had the wound immediately cauterized, but on the advice of an empirical veterinarian treated the wound locally and no anti-rabic vaccine was administered.

On the evening of August 1, 1912, I was again called in to the case. The owner noticed the animal to be off its feed and to be slightly nervous. I saw her on the second of August, but she presented no diagnostic symptoms of rabies; the pulse was fifty-six per minute; the temperature 101; the animal was eating but little.

August 3, I saw the animal at 3 p. m., and noted the following symptoms: Walking around in the box stall, shifting one front leg and resting it some, respirations disturbed, roaring sounds, not eating, attempted to drink but could not swallow, twitchings of masseter and serratus and pectoral muscles, champing the jaws, and occasionally placing the head down at flanks and neighing peculiarly. There were no symptoms of violence, except she was easily startled.

August 4. Not much changed, muscles twitched more, urine voided in jets, weakness of loins, gait staggering, respiration sixty-five, temperature 103.2° F. and the pulse very irregular. There were still no symptoms of violence, and she seemed rational when spoken to by owner.

August 5. The animal showed paralysis of loins, was unable to rise, champed the jaws and drooled saliva, had spasms of laryngeal muscles, and of chest muscles and extended the front limb. The animal grew violent about twelve o'clock and bit at the manger and the floor of the stall. She died in spasms three hours later.

This animal showed a decided urinary disturbance and constipation, with decided symptoms of dumb rabies until the last few hours of life. Negri bodies found in Ammon's-horn smears from the cerebrum.

I shall be glad to hear from practitioners, through VETERINARY MEDICINE, as to the prevalence of dumb rabies in equines.

E. ARTHUR DEAN, B. S., D. V. S.

Guthrie, Okla.

DRESSINGS FOR BROKEN LEGS

In the September issue under the caption "Having received Much, give something," you refer to the lack of replies to questions. Many of we older practitioners have perhaps been negligent in coming to the assistance of the inquirers, but it has been due, probably, to lack of thought rather than lack of inclination. Perhaps some will be aided by the following in reply to the question:

"What is the best dressing for a broken leg, when the patient is a horse?"

This query covers an extensive field but for brevity we will assume that there is a *simple* fracture. My method is as follows:

Suppose the fracture to be of the os suffraginus, the one most common. The parts should be thoroughly cleansed, then packed around firmly with oakum pads extending above and below where the cast is to be applied and then thirty-five yards of plaster bandages, wet in *salt* water (this hardens much quicker than plain water) should be applied in as snug a wrap as possible. It cannot be put on too tight for the oakum will compress slightly and relieve any tendency to obstruction.

If the plaster cast is to extend only just above the fetlock the amount of bandage quoted is enought but I carry the cast to a point above the knee or hock thus insuring rigidity of the limb. If the animal is a light-weight horse I do not sling him but give him a big box-stall. After the first twenty-four hours have passed and the

cast has hardened he will lie down and get up without disturbing the cast, but if a big horse, it is better to use the slings. The animal should be fed bran and hay only and the cast kept on from six to eight weeks then removed and with a good bed supplied, the slings may be dispensed with. Exercise should be encouraged, gradual at first, then more extended. The slings should be removed every second day and the animal cleaned thoroughly and there will be no "bed sores." F. G. L., M. D. V.

Newport, N. Y.

APPLICATIONS FOR SUCCESSFUL WOUND TREATMENT

The treatment of wounds is one of the most important branches of veterinary practice. The first and foremost consideration in treating a wound is the rigid observance of scrupulous cleanliness. Every veterinarian, worthy of practice longs for the advantages of the "System of Antiseptic Surgery" known as "Listerism." Certainly this method would reduce mortality and hasten recovery but the refinements of the method and constant supervision necessary render it practically impossible to use in general practice.

We therefore have to resort to the simpler means of antiseptic lotions and stimulants especially those which keep off flies, allay pain and suppuration and promote granulation of a healthy character.

I cleanse wounds with boiled water, that has been cooled to a point near the normal temperature of the animal's body, using pledgets of sterilized cotton as sponge material. After making sure that the wound has been washed clean, with the sponge holder and sterilized cotton I apply to all parts of the wound the following mixture: Mercuric chloride, one dram; hydrochloric acid, one-half ounce and boiled water to make one pint.

If wound is to be stitched, it is slushed out with boiled water and stitched and covered with plain sterile gauze, kept moist with 5 percent solution of carbolic acid in boiled water. The wound is dusted daily with mixture of boric acid and iodoform. On wounds not closed by sutures I use the following: Powdered aloes, one ounce; denatured alcohol, four ounces, and linseed oil q. s. to make one pint. These treatments or applications are made daily. As far as results are concerned, I believe I get primary union as often as any of the general practitioners in the rural districts and more often than the most of them.

In open wounds the aloes-alcohol-and-linseed-oil mixture is a sure winner. I have been called as far as forty miles a number of times to give treatment to wounds that had been in charge of other veterinarians for variuos periods of time, and have found the poor animals bound with all kinds of mechanical devices (most of them cruel and all of them unnecessary), to keep from gnawing and biting their wounds. I have never seen a wound or sore, surgical, accidental or constitutional that the animal would lick, gnaw or bite after the above dressing had been used twice in twenty-four hours.

Some years ago a druggist in a neighboring town flooded the county with a powder called Barb Better Powder." It was composed of about ninety-nine parts of air slacked lime and one part of lamp black.

The instructions on the can were to dust or sprinkle on the wound from one to three times in twenty-four hours. This soon formed a thick heavy scab that kept the air out and the wound secretion in. As a result the farmers and stock owners reaped a crop of tetanus, that was frightful to behold. In a year's time I traced over one hundred cases of tetanus to wounds to which this powder was applied. I thoroughly exposed it and the "B. B." man is not doing much "Barb Better" business in this country.

I am informed that the recipe for this wonderful mixture was obtained from a one-arm hobo who parted with all of this knowledge in exchange for a brass finger ring. P. F. Ash, V.S.

Centreville, Ia.

QUESTION BOX

In sending questions for this column give name and address (not for publication). All readers are invited to send questions to

this column and urged to send replies to such of the questions of others as they are able.

Have you tried sodium cacodylate as a therapeutic agent? If so, in what diseases and with what success, and in what doses?

What is the action of eserine and arecoline in "heavey" horses?

What is the most common cause of laminitis and in what way does it bring about the conditions we find?

What is your line of treatment for acute laminitis?

Why are the purgatives known as drastic so uncertain in the horse.?

What is antiperiostin? [Udall, Veterinarians' Handbook of Materia Medica and Therapeutics rates this product: "A thirty-percent solution of hydrargyri iodidi rubri in tincture of cantharides."]

What is Harlem Oil? [Udall, Veterinarians' Handbook of Materia Medica and Therapeutics, rates this product: oleum lini sulphuratum terebinthina.]

Did you ever hear of a "ripple on the surface of a majestic ship"? [Yes, but forgive him, for he knows no better.]

ARECOLINE CONTRAINDICATED IN "HEAVES"

Replying to your request for a discussion of the use of arecoline in treating horses suffering from heaves, I will give you an account of my own experience in such cases, leaving the reason for these results to be presented by some reader, more competent than myself.

Some three years ago I first noticed the bad effects of arecoline in horses having the heaves. At this time I was called to see a horse with colic from indigestion. This animal had the heaves. I gave him one grain each of arecoline and strychnine sulphate, and in a short time my patient had all the toxic symptoms that one gets from those drugs; also very pronounced shaking up of the muscular system, great suppression of the heart action and a struggle for breath. I gave several capsules containing quick-acting stimulants, but to no purpose, as the animal died shortly, struggling for breath.

It took me a year to forget this experience, when I again had a case of the same nature as the first. This time I gave only one-half grain of arecoline, and the same amount of strychnine, with better results. I, however, got the same bad heart and the labored breathing, which responded to stimulants, the animal recovering from both the colic and the treatment. I vowed at the time to never again use arecoline in a case of that kind.

Now I got to wondering (most of us, you know, do wonder at times) if it were an idiosyncrasy of those two horses or the drug that was at fault. I was called upon to lay an old horse away that had the heaves very bad and I thought here was a good chance to try arecoline out again. I gave him the same dose as on the first case and got exactly the same results. Dead horse. I have not used this treatment in that kind of a case from that day, and until I know more about it, I never shall.

I gave arecoline in one-grain doses and grain-and-one-half doses until I read an article (by Williams, I think) advising its use in smaller doses, and I commenced to try out that plan. I now give one-half grain, repeated every thirty minutes until I have given four grains or secured a condition that warns me to stop its use, and I get much better results than I did with the larger dosage.

I think arecoline a most valuable drug, and as safe as any drug of that nature, if used only when indicated. I think the great objection to its use by many is the belief that it is a very dangerous drug. It is my opinion, however, that the danger is much overestimated and that this feeling of danger has been engendered by practitioners that seldom or never use it, or when they do they use it as a last resort.

It is regrettable that there is practically no drug of the nature of arecoline that is infallible in its action.

But referring again to the "heavey" cases, arecoline is not supposed to depress any organ but the heart, which in these conditions is not at fault. Both Doctors Williams and Fish have written quite a bit on this drug and I wish that they or some other of our leading lights would tell

us through the pages of your most excellent journal, if arecoline is contraindicated in animals afflicted with heaves, and if so, why? Who else has had an experience similar to my own? G. W. STANBRIDGE.

Winchendon, Mass.

[The explanation given by Dr. E. L. Quitman, and doubtless the correct one, for this untoward action of arecoline in cases of "heaves" is as follows:

Arecoline causes an energetic contraction of the involuntary circular muscles of the alimentary canal *and of the respiratory tract.* In most cases of heaves the lumen of the bronchioles is markedly narrowed by thickening of the mucous walls and sometimes also by a tenacious exudate; therefore even a slight contraction of the circular muscular tissue in this part of the respiratory tract closes or nearly closes the bronchioles and results in suffocation of the animal.

An additional element of danger in many of these cases is the abnormal hypersensitiveness of the muscular coat of the bronchioles, due to mechanical irritation from the chronic cough that these animals have. This renders these muscles very susceptible to the influence of any excitant, as arecoline, and in part accounts for the alarming symptoms and fatal termination following its exhibition.

When arecoline is given to an animal that has "heaves" all danger may be averted by the administration hypodermically of a full physiologic dose of stramonium, hyoscyamine or atropine, and repeating it in one hour. Either of the first two named drugs relieves the spasm in the bronchioles somewhat better than atropine, but the latter is very satisfactory, less expensive than the others, and always at hand. Do not neglect the second dose as the effect of the first will subside in approximately one hour while the action of arecoline lasts somewhat longer.—ED.]

CHRONIC NEPHRITIS IN THE DOG AND CAT

(*Continued from page 490*)

establish the soundness of this point of view:

1. November 15, 1910, a dog suffering from a cyst in the testicle was castrated. The ablation of the affected testicle was effected by torsion. No hemorrhage was produced, and asepsis as rigorous as possible was practised during and after the surgical intervention. The next day there was no fever, the succeeding still none, everything pointing to a happy termination, when on the 18th, in the morning, the dog was found dead in its lodging. The autopsy showed that it was suffering from chronic nephritis. No acute infection was demonstrated.

2. January 24, 1911, a cat was operated on for mammillary cyst. The conditions following immediately after the operation were the same as usual. The third day the patient died of chronic nephritis. The autopsy showed the presence of yellow kidneys.

3. March 6, a cat suffering from nephritis was operated on by hysterectomy. Everything led us to expect a happy termination. There was no fever the next day nor the day following, the cat being vigorous and not being anemic. Three days after the operation it died of nephritis. Autopsy showed that there was no infection; the ventral wall was already partially healed.

4. May 13, we operated upon a dog suffering from a perineal hernia, caused by dilatation of the rectum. This was resected and sutured at the anus. Three days later the dog died, without fever, of sclerotic nephritis.

5. December 1, we removed from a female dog a mammary lipoma. The animal died of chronic nephritis the second day after the operation. The diagnosis of this case of nephritis had not been made before, through lack of examination.

Instructed by that which precedes, we have decided not to operate again upon an adult subject without making, in advance, a chemical examination and eventually a microscopical examination of the urine. If it contains albumin and especially if it contains casts, we shall advise the sacrifice of the patient rather than to expose it to post-operative complications.

Your attractive and instructive journal (May issue) is certainly a winner.

A. T. PETERS.

Springfield, Ill.

Nan

By GORDON G. BURDICK, M. D., Chicago, Illinois

AUNT MARY

IT was a happy thought when I sent for Aunt Mary. Many years of association with this good woman had taught me that she was the one to get when I was in a situation requiring great tact and delicacy. She was one of those tactful persons who rush in like a snow plow and literally cover up all opposition. No one had the temerity to get in the way; she was a person of quality before "de wah," and the family had many slaves in their possession. Unfortunately, their plantation was located in such a place that Sherman's army ate them out of house and home while the Colonel, her husband, was killed in the Battle of the Wilderness.

The good woman, recognizing the inevitable, gathered up what family jewels she had succeeded in hiding from the raiders, and having saved one ham which she had buried under a stone, with a rabbit's foot, in the full of the moon, started out to seek her fortune. She drifted from Georgia to St. Louis and worked as a seamstress for a while, and eventually was set up in a boarding house by an old friend of the family.

She drifted to Chicago in anticipation of making a fortune during the World's Fair, and as usual was one of the earlier birds who arrived several years too soon. The boarding house worms had not begun to hatch and Aunt Mary had to make many shifts in order to pay the rent and keep her larder full. She was one of those people who can always be relied upon in an emergency. She would drop everything and come when needed, and between keeping boarders, sewing by the day, and in hard seasons taking in a wash, she still found time to do some nursing in times of need.

I was a long-legged third-year medical student when Aunt Mary captured and adopted me in her heart and home. I had been having some serious trouble with my room-mate; he was harder up than I was and not quite so provident.

He took to wearing my dirty shirts after I had discarded them and wore them so long that the women could not wash them. Now this was a serious affair to a student as he must try to be presentable and when he has only three white shirts in his wardrobe, and two of them were working overtime, emergencies would occur where he had to go to bed, while the kind landlady washed his only garment.

Being of a patient and accommodating disposition I was reluctant to curtail the privileges of my room-mate, and probably would have continued to forbear with him if he had not fallen in love with a red-headed girl. This was the last straw; I did not mind listening to exhortations on the value of red hair, in giving great intellectual development to woman, but what I did object to was his wearing my clean shirt and giving me the privilege of wearing it a few days when he had gotten through with it, and at last I was aroused to the necessity of doing something radical to abate the nuisance, so I started out one fine Sunday morning to find a new hall bedroom which would be so small that after I and my wardrobe were installed, there was no danger of any other person intruding.

Fate sent me to Aunt Mary's door and when I had told her what I was looking for and who I was, I was welcomed with both arms and assured that "she could fix me up a plenty."

We climbed four flights of stairs and I found a charming room in the attic, just what I was looking for, and well within my means. So we shook hands on the bargain, and I surreptitiously moved one night while my room-mate was reciting "Come into the garden, Maud" to his girl. I was sorry to go without leaving my address, but the stress had become so great, that I was willing to escape even at the price of one shirt. I did not have the heart to steal out in the night while he was sleeping as he always looked so innocent while asleep and recited poetry, between telling the girl that he would die if he did not get her, and besides he generally slept in the shirt. It seemed a great

Aunt Mary and I Were Pals

price to pay for liberty at the time, but I rejoiced many times that it was the innocent cause of Aunt Mary's adopting me.

I was introduced to her many friends and acquaintances as her "Doctah Boardah" and I was called upon to go through my paces like a properly trained dog when she had some people present whom she especially desired to impress with her connections. I lent some tone to the family and was worked for all there was in it. Aunt Mary and I became "pals" and we soon learned to depend upon each other when adversity was present. It was she who deftly patched my scant wardrobe and I could always be depended upon to feed her menagerie when she was out looking for the early worm. She was one of those great-hearted women who could not bear cruelty in any form, and no tramp, either man or beast, was ever turned away

from her door hungry, and she was always bringing some maimed or sick animal home to nurse it back to health.

I was a welcome member of her family owing to the fact that I had adsorbed some knowledge of medicine and would good naturedly use my skill in the interests of her pets. I had just gotten well settled in my new location when I had my "first case." It seems one of the neighbor's dogs caught a cat napping, and to escape she ran in front of a car, and while she was not hurt, the dog, being so intent on his quarry, had a head-on collision with the car. When Aunt Mary, who happened as usual to be on the scene, brought him in, I was in doubt whether she had an old accordion with hair on it or had found a new freak effect in dogs. However, I was to understand that much was expected of me and that it was up to me to make good. So by using the kitchen table as a base of operation I anchored the dog's head in the substantial hands of Aunt Mary and getting a tail hold, succeeded in straightening out the kinks, and maintained

It Looked Like an Accordian with Hair on it

them in position by a plaster bandage. It only remained to set one hind limb and the dog was put to bed near the kitchen stove. I fully expected him to die as he was paralyzed behind, but had not counted on Aunt Mary's skill in nursing to pull him through. He recovered and helped share the family honors with a one-legged parrot, a three-legged cat and the Doctah Boardah.

This dog was a perennial source of conversation when we had visitors and I believe aided much in building my earlier reputation. To listen to Aunt Mary graphically describe the dog's condition and my heroic conduct in the affair was bound to impress any one with my skill.

It should not surprise any one that I sent for this resourceful woman when I found myself unable to handle the little Fury I had brought down from the attic, and I was not disappointed, as she came in under a full head of steam and brushing the negro help aside like flies demanded to know where her "Doctah was." Upon hearing my voice calling her, she bounded up the stairs and taking

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The original **Beebe Anti-Influenza Vaccine,** of superior efficiency, has been paid the highest compliment by its several imitations now on the market.

It has proven its merits in the prevention and cure of Influenza, Strangles and Shipping Fever—for which it is The Ideal Preparation.

Its success with others justifies your confidence.

J. T. KENNEDY, Veterinarian

St. Paul, Minn., Feb. 29, 1912

Beebe Biological Laboratories,
City

Gentlemen:

Regarding the preventive action of your Anti-Influenza Vaccine, I will say that I have used it in several outbreaks, when several hundred horses were concerned, and in my opinion the disease has been prevented in 95% of the cases; the remaining 5% having the disease in very mild form.

The cases were mostly of the mixed infection—strangles, influenza and stable infection.

The abscess formation being entirely eradicated after use of the Vaccine.

Yours very truly,
J. T. KENNEDY, V. S.

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ST. PAUL, MINN.

in the situation at a glance demanded to know what "youons are all doin' to dat chile." Before I could explain the girl turned and with a wild cry ran and threw her arms around Aunt Mary and buried her face in the folds of her ample dress.

"Tag, you're it," I remarked, "you're adopted, Aunt Mary. Now if you can only persuade her to put on some clothes we will take her home." The child was moaning and trying to bury her face deeper in Aunt Mary's person, while the good lady was stroking her hair and singing those sweet southern lullabies in a low, crooning, alto tone, so dear to the heart of a southern bred person; gradually the child's muscles relaxed and she half smiled as Aunt Mary turned her head backwards and kissed her, then gathering her under the protection of one arm, she assumed a fierce air, and demanded that "weons all leave her precious baby alone" and as there seemed to be nothing else to do, we all stepped out and left her to the tender mercies of our Pal. In a few minutes she came to the door and asked me for one of the girls and I sent Blanche in to help her and between them they soon had her dressed and had learned her name.

We Soon had a Georgia Camp Meeting in Action

Aunt Mary had not had time before to notice just the character of the place she was in and for the first time began to realize that something out of the ordinary was going on, and she began to take the inmates to task for exposing so much of their persons, and was somewhat disconcerted when I told her that she could see more of them if she wished. It gradually began to sink into her mind that she was seeing for the first time something that she had always regarded with horror all her life, and turning around to Blanche looked at her fixedly for a few minutes, and said, "No, it can't be so, you are too sweet a girl for such a life, what would your mother say if she should see you?" The unexpected and tabooed word of "Mother" started pandemonium in a minute. Some of the girls ran out sobbing hysterically while Blanche threw her arms around Aunt Mary and sobbed as if her heart would break. I was conscious that I was cutting a pitiable figure in the affair but it had gone beyond me, but just what to do with a half dozen young women in hysterics from a guilty conscience has always been beyond me, so I welcomed the interruption from one of the colored attendants who announced that Mr. Pottah wanted to see Miss Blanche. "Tell him I am busy, Sam, and can't see him." "Yessir, yessir."

He returned in a few minutes with a more insistent message that raised Blanche's ire and she sent word that for the first time in her life she was doing something she liked to do and if he didn't like it, he had better crawl in the refrigerator.

The situation had gotten beyond me as Aunt Mary could not lose an opportunity of doing some good when she had a chance, and I found myself an unwilling spectator of a Georgia camp meeting She gave a short prayer and then her rich alto voice rang out in "Just as I am without one plea," and she looked up with surprise and disappointment when she failed to hear my tenor; I caught the idea and joined in, it was the safest thing to do as I always stood in awe of her religious convictions. This was one point in her character that defied argument. She was a strict Presbyterian and believed in the whole thing even to the damnation of the innocents.

It was not many minutes before we had a revival meeting in full swing as our audience of both men and women began to increase through curiosity and Madame Mindo was beside herself with rage as she saw some of her most popular girls singing with fervor. She grabbed my arm and after pulling me out in the hall asked me to get that "old huzzy" out or she would demoralize the house. I told her I was sorry but I did not believe I could get her out with a derrick until she was ready, and anyway she was to blame for the whole affair as the circus would not have happened is she had not shut the girl up.

The Madame wrung her hands and then had a happy thought. "I will give $100.00 more if you get her to go." "Well, I will try, so shell out and I will do my best." I watched my cue and in a breathing spell suggested that the cab hire was piling up at one dollar an hour and we had better get out. To my surprise Auntie saw the practical side of the question and gathering the girl in her arms started to leave, when things broke loose again. It seems three of the girls wanted to go with her and she was determined to take them out of the "hell hole," as she expressed it, while Madame Mindo was equally determined that they should not go. I don't know just what would have happened if one of the visitors had not been a high city official and he impressed upon Madame Mindo's mind that she was going to get into trouble if she did not let them go, so we all filed out after getting the girls' clothes and calling another hack we started on our way to Aunt Mary's house.

THE UNDERWORLD

This wonderful place where I have introduced my readers is not well understood by society. It is true that a few sociologists have begun to take an academic interest in this great human maelstrom and are trying to devise ways and means to curtail its growth, yet not having been admitted into its intimate society, they can not understand its code of ethics. The average person believes that no one besides the criminal, resides in this lower crust of society, and thereby they make a great mistake and do many deserving people a great injustice.

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ITHACA, N. Y.

this place that true religion survives and self-sacrifice is evident, and it is here that we occasionally get the maddening crime of some human pervert. A strange place with the contrast of barbaric luxury and starvation stalking side by side. It is in this place where we see the young woman living next door to a popular brothel, subsisting on tea and crackers, and so poorly dressed that she almost freezes as she goes from restaurant to hotel trying to make the pittance that will keep the breath in her frail body, and why does she do it? She knows that by going next door she would be welcome, that there is too much to eat, too much to drink, and cold is never known. Why is she starving when she could live in plenty, by simply changing the number of her rooming house, why don't she go? This question I have asked many times in my search for information and it is in the answer that our true womanhood comes out.

"Why don't I go?" she will ask. "I scarcely know, something holds me back. Many times I have about made up my mind to go, as I have many times made up my mind to jump in the lake and put an end to my hard life. Somehow I just can't, my virtue is the only jewel still left in my collection. Starvation has robbed me of my beauty, I have no more fine feathers, I am a plain human sparrow. I live upon the crumbs that others overlook, and like the sparrow I must fight other birds for even this poor subsistence or starve. I know I could improve my material condition by going, but, Doctor, somewhere in my dreams at night I see a boyish face, he seems wonderfully tender as he looks upon me, and every time I get hungry and my resolution gets weak, he consoles me and stands as a warning sentinel in my path. Who knows, maybe God is trying me. But it is hard to think he would put such a burden as I have carried on a starved mind and body. Sometimes I dream of a home with a husband and baby, and while I know I do not stand any chance now, as no sane man would marry me, yet I am hoping that God in His wisdom will reserve for me just a little humble cottage with some good man's love to be my 'owney own' either in this world or the world to come." Was she right, great moralist? What would you have done, if similarly situated? Would you be willing to starve and go without clothes for an ideal? In this case she was right. Providence evidently was trying her, as the attention of a good-natured, fur-coated farmer was attracted to her bitter crying as she was hastening home to her miserable bedroom without food, to spend another night of horrors. Her forlorn appearance and evident poverty touched the farmer's heart and he wrapped her up in his fur coat and carried her carefully into a saloon to thaw out, and he watched her with considerable interest as she ravenously ate the food set before her from his bounty and he remarked "Well, little sister, the world don't seem to have used you well, I want you to go with me to my great farm. I am never hungry or cold and you are welcome to come, and if you like me after a while as I like you, I will marry you. Will you go?" Would a lost soul go into the Gates of Paradise? She went and while I have never seen her face from that day to this, occasionally a good, fat, juicy turkey finds its way to the Doctor's table with a letter having a baby's hand outlined that somehow each year seems to grow larger. In late years a souvenir card is found from time to time in my mail signed simply "Laura," and somehow I feel that the little girl is paying her respects to the good Doctor who lives so far away in the great city.

This girl is one who was fortunate among ten thousand others who were compelled to drag out their miserable existence until death mercifully came to their relief. The underworld receives its growth from the new, stupid emigrants and the victims of accident and fluctuating industrial conditions. They are in the main honest, but chronic starvation soon undermines their health and morals, and after a few years, ambition is dead and they are content to live like the sparrow. The gaudy saloon, with its brothel attachment, attracts many people from the upper walks of life, who come out of curiosity and stay because they have been inoculated with the sociologic poison and are unable to escape. If we investigate we shall find a seething maelstrom of humanity being swayed by the laws of the social motion, some caught in the upper current and carried onwards and upwards with an irresistible force that places them in the upper world with their ambitions fired and in a condition to compete with any one.

We shall see also a steady stream of people who should know better swept into the lowest depths, owing to a defective nervous organism. No more pitiable sight is ever seen than that of a gently reared girl as she comes tumbling downwards from a secure position in society, grasping at everything to stay her descent, yet swept downwards by an irresistible social stress. Many times in the earlier years of my practice I have been enabled to stop their descent and after taking them over to some mission, have pointed out the Gospel ladder and after telling them of the terrible darkness below have advised them to reverse their course towards the light. My "climb, sister, climb," has rung

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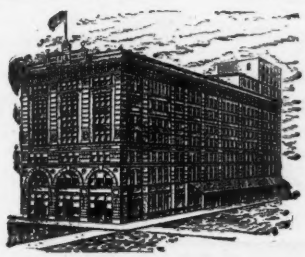

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into the ears of many a mother's daughter, who had been allowed to come alone to a great city, to study music or some other educational factor in which they had outgrown home talent, and many of these girls have become respected wives and mothers, with no one the wiser for their excursion into the realms of darkness. When Aunt Mary came to our city, she secured a house in what was then called a good part of the city, and after she had lived in her place for a year, a great railroad came to the conclusion that they needed a freight house and switchyard, so they purchased and condemned several blocks and tore down the buildings, which necessitated a shift of the underworld and Aunt Mary found herself in the center of a very undesirable class of our population, with a

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